TS
182
2
364
ISC
AA
5
#10

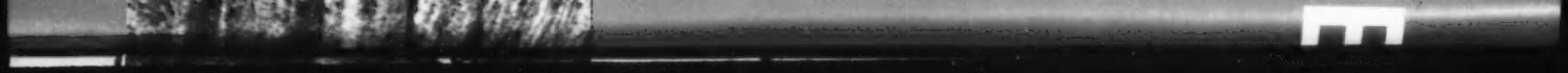
...val Safety Center Publication

approach

APRIL 1971 THE NAVAL AVIATION SAFETY REVIEW

DETROIT PUBLIC LIBRARY
JUN 10 1971
TECHNOLOGY & SCIENCE

SAFE



st
N
d
o
H
G
o
w

u
c
F
s
w
g
T
a
a
a
l
a

INSTRUMENT FLIGHT

RECENTLY, an F-4J aircraft departed a naval air station at night for a short flight to NAS Homebase. NAS Inland was filed as an alternate since the destination weather was forecast to be 100 foot obscured, visibility one-fourth to one-half mile, in fog. However, upon initial contact with NAS Homebase GCA, weather was reported as, "Measured 200 feet overcast, visibility one mile in very light drizzle and fog, wind 240 degrees at four knots."

The F-4J proceeded to the tacan initial approach fix under radar contact. The straight-in approach was commenced at 17 miles, right of course and correcting. Final approach was commenced at six miles with only slight glide slope corrections until reaching three miles where the GCA controller instituted a no directional gyro approach to better align the aircraft on centerline. The aircraft was observed to go above glide slope at one and one-half miles and GCA called for a missed approach at three-quarters of a mile because the F-4J was too high above glide slope. (The aircraft was observed on radar to level off at one and one-quarter miles, about 300 feet above ground level.) The controller instructed, "Turn left heading 230, climb and maintain 1500 feet." The RIO then broadcast, "We got the strobes just about the time we waved off." The GCA outside observer visually sighted the aircraft at about one-half mile but lost contact as the aircraft passed overhead. Forty-two seconds later, the tower and several personnel in the field area observed a bright orange flash about one mile west of the field. The air station crash crew, upon arrival on the scene, discovered that the aircraft had been demolished and both occupants had been fatally injured.

The investigators could find no evidence of any malfunction involving the aircraft. They concluded that the primary cause of this accident was the failure of the pilot to properly execute the missed approach. Evidence showed that the pilot did not retract gear and flaps or execute a turn after being issued the missed approach but flew an appreciable distance down the runway prior to making a port turn. Indications are that he broke out of the overcast, or achieved marginal visual flight conditions at about the time the missed approach was issued. Thereafter, it appears that the pilot attempted to fly a visual/contact approach under the overcast rather

than executing the missed approach.

Of possible significance is the fact that the pilot of the aircraft had a total of only 56 hours in this model/series aircraft. This time was spread over a year but during the previous three months period, he had flown 35 hours in model/series aircraft. He had accumulated only 1.6 hours actual instrument time, one-half hour simulated instrument time and 1.8 hours night time during the preceding three months period.

One way or another, it appears that the demands of this particular instrument flight simply exceeded the pilot's capabilities at the time. This raises the question of why this should be so. He was instrument qualified in accordance with OPNAV directives and up until the time the missed approach was issued, was operating in compliance with OPNAV approach minimums although he did violate squadron-established minimums. Before proceeding further with this discussion, consider the following additional accident briefs:

- An F-4J impacted the water on a night instrument approach prior to recovery aboard carrier. The pilot was very experienced in model/series aircraft but had accumulated only 2.4 hours (actual) instrument time during the previous three months period. The cause of the accident could not be determined but the aircraft accident board concluded that the most probable cause was distraction from proper instrument scan under low altitude night conditions.

- An A-4C flew into the water during a night CCA approach. The ceiling was unlimited and visibility was 10 miles but there was no horizon. This forced the pilot to rely on instruments to a high degree. The board stated the opinion that the pilot had allowed outside distractions to divert his attention from basic instruments during the last part of his descent.
- A T-1A pilot filed for a destination forecast to be at or near minimums. Upon arrival, he was notified that the field was below minimums for any type of available approach. Nevertheless, he attempted two approaches. He flew the first approach to a missed approach. On the second approach, he knowingly descended below minimums and crashed.

More accident briefs could be listed but these should be sufficient to show that instrument flight can be hazardous under certain conditions. Identifying these conditions is difficult but it may help to review the Navy's system of training/qualification of pilots and the conditions under which instrument flights are undertaken. Hopefully, this will also suggest the corrective measures which can be taken to reduce or eliminate exceptions to safe instrument flight.

General NATOPS (OPNAVINST 3710.7E), paragraph 1220, sets forth the prerequisites for a Navy standard

1220 REQUIREMENTS FOR INSTRUMENT RATINGS

a. Standard Rating. Minimum requirements for a standard instrument rating are as follows:

(1) Fifty hours of instrument pilot time under actual or simulated instrument conditions.

(2) Successfully complete a NATOPS instrument evaluation in accordance with the NATOPS Instrument Flight Manual.

(3) Within the preceding 6 months:

(a) Six hours as pilot under actual or simulated instrument conditions.

(b) Twelve final approaches as pilot under actual or simulated instrument conditions, at least six of which must be precision approaches.

(4) Within the previous 12 months:

(a) Twelve hours as pilot under actual or simulated instrument conditions.

(b) A total of 18 final instrument approaches under actual or simulated instrument conditions at least 12 of which must be precision approaches.

Fig. 1

ment card (refer to Fig. 1). This is a pretty impressive list of requirements. It is even more impressive when you consider each of the requirements individually. Consider the requirement that an individual successfully complete a NATOPS instrument evaluation in accordance with the NATOPS Instrument Flight Manual." This requirement is a substantial one because it implies that the successful candidate will have a good working knowledge of the information and requirements therein. This manual is divided into 10 sections, as illustrated in Fig. 2. This gives the reader a much better indication of what is required to qualify for a standard

Continued

The NATOPS instrument flight manual is divided into 10 sections as follows:

SECTION I – AIRCRAFT INSTRUMENTATION

This section consists of two parts; Flight Instruments, which describes the various flight instruments, their principles of operation and inherent errors; and Navigation Instruments, which discusses the navigation instruments common to the majority of naval aircraft.

SECTION II – NAVIGATION FACILITIES AND EQUIPMENT

Describes navigation facilities and equipment available to the pilot and/or navigator.

SECTION III – BASIC INSTRUMENT FLIGHT PROCEDURES

The five parts included in this section are: Attitude Instrument Flying, Instrument Flight Maneuvers, Instrument Patterns and Confidence Maneuvers, Instrument Navigation Procedures, and Holding Procedures. Specific procedures are given where applicable.

SECTION IV – IFR FLIGHT PROCEDURES

This section contains five parts as follows; Elements of Preflight Planning, Flight Clearance, Takeoff and Departure, Enroute Procedures, and Terminal Procedures.

SECTION V – EMERGENCY PROCEDURES

Procedures to be followed in the event of navigational aid and/or instrument failures are provided. Lost communications, section penetrations and approaches, low fuel approach, and unusual attitudes and recovery procedures are also discussed.

SECTION VI – INSTRUMENT FLIGHT ENVIRONMENT

This section contains two parts; Sensations of Instrument Flight, which describes the senses and how they are affected during instrument flying and the different types of disorientation; and Weather, which includes preflight planning, inflight weather services, pilot responsibilities, and weather conditions hazardous to flight.

SECTION VII – COMMUNICATIONS PROCEDURES

SECTION VIII – INDOCTRINATION

This section outlines a suggested ground and flight training syllabus to help develop and maintain a high degree of instrument flight proficiency.

SECTION IX – FLIGHT CREW COORDINATION

This section lists the duties of crewmembers during instrument flight.

SECTION X – NATOPS INSTRUMENT EVALUATION

This section establishes and discusses the concept of the evaluation and includes a grading criteria, final grade determination guidelines, and required records and reports.

Fig. 2

instrument rating than does a bare recital of OPNAVINST 3710.7E requirements.

To go a step further, consider just one section of the Instrument NATOPS Manual in more detail. Section IV pertains to IFR Flight Procedures. It contains five parts, as follows:

- Elements of preflight planning.
- Flight clearance.
- Takeoff and departure.
- Enroute procedures.
- Terminal procedures.

Now, consider *only* the introduction to the first of these parts (refer to Fig. 3).

If it is beginning to appear that qualifying for a standard instrument rating is a substantial achievement – that's the idea. It *is*. It entails not only a considerable amount of inflight training but a considerable amount of training on the ground, as well.

PART 1 – PREFLIGHT PLANNING

INTRODUCTION

Proper preflight planning is an essential component in the conduct of a safe and successful flight. It involves a thorough knowledge of individual aircraft capabilities/limitations and an understanding of the rules, regulations, procedures, and general information found in many directives and informative documents. Group 1 below lists publications essential to most IFR flights, and a brief description of their contents. Group 2 contains other publications which may be useful to the pilot in preflight planning – depending on the proposed mission.

Group 1

1. NATOPS Manuals and NATOPS Flight Manuals – Promulgated by the Chief of Naval Operations for specific aircraft; contains standard flight doctrine and optimum operating procedures for the aircraft concerned.
2. Flight Manuals – Approved by the Commander, Naval Air Systems Command and issued for each model aircraft; contains detailed instructions and operating limitations for operation of the specific model aircraft.
3. Federal Aviation Regulation Part 91 – Basic regulations governing civil flight operations. Applies to naval aviation except where OPNAVINST 3710.7 series provides for more stringent requirements.
4. OPNAVINST 3710.7 series – General Flight and Operating Instructions. Contains basic guidance for all naval flight activity, lists selected instructions pertaining to flight operations.
5. Flight Information Publication (FLIPS) – Information pertaining to the scope and content can be found in the FLIP Section I – General Information.
6. NOTAMS – See next column (in Instrument NATOPS Manual) for detailed description.
7. Meteorology for Naval Aviators – self-explanatory.

Group 2

1. Airman's Information Manual (AIM) – Issued by FAA and is roughly the civilian equivalent to the FLIP; normally available at major aviation activities only, i.e., Naval/Marine Corps Air Stations, etc.
2. DOD Catalog of Charts and Flight Information Publications – Contains detailed descriptions, examples, and requisitioning procedures for charts and related flight publications.
3. Air Operations Manuals – Promulgaged by Navy and Marine Corps Air Stations, Auxiliary Air Stations and Air Facilities; contains local flying rules and instructions.
4. U.S. Air Force Foreign Clearance Guide – Familiarization with this document required only when flight outside the continental U.S. is anticipated; used in conjunction with FLIP Section III – International Rules and Procedures and OPNAVINST 3710.2.
5. Chart Updating Manual (CHUM) – Issued monthly to provide updating information for selected charts.
6. DOD Chart Bulletin – Issued monthly and lists latest editions of charts and latest changes to FAA and military aviation documents.
7. DOD Bulletin Digest – Issued semiannually and replaces previously issued monthly bulletins.

Fig. 3

rst of

for a
antial
nly a
ut a
well.

ment

tory.

d by
o the
ation
Air

ation
tions,
harts

Navy
Air
lying

de –
uired
U.S.
FLIP
dures

ssued
for

lists
FAA

and

The most logical place to provide the training for *initial* qualification of pilots is during the flight training program. For this reason, every student naval aviator receives weeks or even months of inflight and ground instrument training during the course of the flight program. Students do not seriously *begin* instrument training until after they have mastered VFR flight in a wide variety of situations. They do not *complete* instrument training until they are well along toward completion of the flight program and have amassed a substantial amount of total flight time.

Upon completion of the flight training program every naval aviator faces the task of maintaining the proficiency he possesses and *adding* to his store of knowledge and experience during the process of fleet operations/training. OPNAV instructions require every naval aviator to maintain the basic qualifications for a standard instrument rating (or higher) unless a specific waiver is granted. How does he go about doing this?

The first paragraph of Section VIII of the NATOPS Instrument Flight Manual states:

"A high degree of instrument flight proficiency is the key to safe, effective operations during instrument flying and is mandatory for meeting unit all-weather operational commitments. A training syllabus shall be established within each unit to assist both the pilot and the unit toward acquiring and maintaining this capability. In implementing this program on a unit basis, a long-range training plan will be very helpful toward accomplishing the desired result without a significant reduction in mission training." The manual then goes on to outline a suggested ground and flight training syllabus.

Some aviation units have the type of aircraft and engage in operations/training which provide a natural environment for maintaining qualifications and increasing instrument proficiency. Other units are not so fortunate. They either operate single-place aircraft (in which instrument training is made more difficult) and/or are primarily engaged in operations/training for extended periods where adequate instrument training for all assigned pilots is either not feasible or is impossible. To assist operational squadrons which have a limited capability to provide pure instrument training to assigned pilots, a number of instrument training squadrons are established on both coasts for the purpose of providing instrument training in aircraft which are comparable to the one the pilots operate. Nevertheless, the responsibility for insuring adequate instrument training and proficiency of pilots assigned rests primarily with each command.

All this means that the vast majority of naval aviators have a current "ticket" for conducting instrument flight in naval aircraft. Does this fact make all naval aviators equally qualified as instrument pilots? The answer has to be no. A few of the reasons for this are differences in:

- Total flight time.
- Total instrument time.
- Total time in model aircraft.

Continued

• Proficiency (currency of training, education and experience).

• Physiological factors (fatigue, illness).

• Flight environment (weather, traffic density, navaids, etc.).

• Motivation.

In view of all these varying factors what *is* the value of an instrument ticket? The value is, it *insures* that all naval aviators have a solid *foundation* of instrument training in the air and on the ground. And, it *allows* a naval aviator to undertake instrument flight under *proper circumstances.* The two most basic circumstances under which IFR flight is proper are:

• To recover from inadvertent entry into IFR flight conditions.

• To fulfill operational commitments under all-weather flight conditions.

Naval aviators are justifiably proud of this all-weather operational capability. Its importance to the Navy's role in the national defense cannot be overemphasized. It is widely recognized that this capability cannot be long maintained without a broad, continuing training effort. In this context, the *overall* training effort cannot be separated from the operational requirement. However, the need to conserve resources makes it entirely proper (and necessary) to differentiate on a case by case basis between operational requirements and training requirements. To put it another way, there is an uncontested need for instrument training flights on a Navy-wide basis but in the absence of any compelling operational requirement, this should be tempered with consideration of the need to conserve resources.

This means that, except for the two most basic reasons for flying instruments (recovery from inadvertent IFR flight and fulfilling operational commitments), every IFR flight which is planned and undertaken should take into consideration the following:

• The need for the flight.

• The requirements of the flight.

• The capabilities of the pilot, aircraft and supporting personnel.

Who should make these judgments? That depends, but very rarely will the requirement for making these judgments fall upon only one person. In the majority of cases, making these judgments will involve the entire command structure, as well as the individual pilot.

Foremost in the command structure is CNO. He sets the basic guidelines, or *minimum* requirements. General NATOPS (OPNAVINST 3710.7E), for example, establishes the flight clearance procedures and absolute minimum requirements for weather and fuel.

Intermediate commanders (type commanders, fleet air commanders, base, ship and air wing commanders) are also very much involved in the decision-making process. It is they who make the operational and training commitments, provide the aircraft and necessary support, control training quotas, specify training cycles, establish cross-country policy guidance, provide base and ship support facilities and provide guidance or direction for operations under questionable circumstances.

The C.O. is one of the most important individuals in the decision-making process. It is he who is charged with executing the policy of higher authority. His role naturally goes much further than merely abiding by regulations. It covers such a wide area that it cannot be fully explored in this limited space. Suffice it to say that he has an interest and a responsibility in every aspect of every flight undertaken by his pilots or aircraft. This does not necessarily mean that he will personally direct every operation. It does mean that, acting either personally or through his command organization, he will provide direction and guidance in sufficient detail to insure the safety of flight operations under his control. This may take many forms. For example:

• He may personally review the training jackets of assigned pilots at periodic intervals.

• He may require the executive officer or the operations officer to personally review the training jackets and provide him with periodic verbal or written briefs.

• He may establish specific limitations on the number of hours/sorties which a pilot may fly during a given period in order to preclude fatigue.

• He may lay down specific policy to guard against some recognized deficiency. For example, if his whole unit has been involved exclusively in day, VFR flight operations for an extended period of time, he may raise the minimums for making instrument approaches.

• He may require pilots who are requesting cross-country flights to submit completed flight logs and completed flight plans. In an appropriate case, he may require requesting pilots to complete a simulated flight

in a training device before approving such a request. He may require the pilot to perform specific study in preparation for such a flight, e.g., study of arresting gear, lighting systems, etc., at fields to be visited. The list is endless. The point is, the C.O. can take whatever action he deems necessary to insure the readiness of an individual pilot or aircraft for instrument flight, cross-country or otherwise.

What about the pilot? What is his role in promoting safe instrument flight? Obviously, his role is a very important one because it is he who must perform the actual flight and associated functions. Moreover, even though many of his judgments will tend to be subjective, he is often the only person who knows many of the facts which have a bearing on the safety of any particular flight. Is he really going to be able to hack the program if it becomes necessary for him to file a flight plan in the air while controlling his aircraft through a missed approach at night, operating radios, etc.? Will he be able to make a proper judgment (and take proper action) if he sees he is about to penetrate a severe thunderstorm but is unable to obtain amended clearance because of high-density traffic or communications overload? Will he be able to cope with potential problems – radio or navaid failure, for example? Is he rested and in good physical condition for the flight or did a late-ending party last night leave him feeling under the weather? If conditions deteriorate beyond acceptable limits while he is at a stop enroute, can he make the necessary decision to wait for conditions to improve – or will he be likely to succumb to the lure of "get-there-itis" or "get-home-itis?" Has he really done all the necessary planning for the flight or does he intend to play it by ear?

Fortunately, most instrument flights are not nearly as grim as the possibilities we have envisioned. The vast majority of naval aviators are professionals who have a solid foundation of education, training and experience which makes them very well equipped to undertake most instrument flights under varying conditions. This is borne out by the thousands and thousands of instrument flights which are routinely and successfully completed each year by all elements of naval aviation. But, there are exceptions. NAVSAFECEN records show that many of these exceptions can be traced to one or more of the following factors:

- *Distraction.* Pilot diverts his attention outside of aircraft for too long a time in marginal weather conditions, allows scan to break down, becomes disoriented.
- *Complacency.* The degree of difficulty of flight is underestimated and/or capability of the pilot is overestimated. Pilot may not operate radios or other controls with due care. An example is tuning wrong tacan station and making an approach to the wrong location. Pilot may fail to remain alert and is therefore unable to cope with some unrecognized/unexpected situation.

- *Fatigue.* Pilot undertakes demanding flight. Complications arise. Pilot has a reduced capability to cope with situation and becomes overloaded with tasks.
- *Personal desires.* Pilot is not objective. He initiates a flight (or presses on) into a situation beyond the point of good judgment (get-home-itis or get-there-itis).
- *Lack of proficiency.* Can apply to old hands as well as the nuggets. A relatively inexperienced pilot may get into a situation which is beyond the limits of *any* previous training and experience. Old hands may get into situations which exceed *current* capability due to lack of *recent* training and experience. In addition, old hands sometimes fail to recognize that overall instrument experience is not always directly transferable from aircraft to aircraft. That is, there is a potential for a very experienced pilot to get into trouble if he gets involved in a complicated situation while operating an aircraft with which he is not thoroughly familiar.

To sum up, there is a well-established system which provides a basic foundation of education, training and operating guidelines designed to insure safe instrument flight on a routine basis. This is the backbone of the Navy's all-weather operational capability. The relatively few exceptions to safe instrument flight can be reduced or eliminated only by giving thoughtful attention to the authorization, planning and execution of each and every flight.

Remember: Glasses do strange things to vision – especially after they have been drained and refilled a couple of times.

Short Snorts

Education covers a lot of ground but it doesn't cultivate it.

Delta *Tech Review*

Well I'll Be . . .

ONE WAY to lose friends and alienate people is to put them on the spot after a period of time has gone by that makes it hard to remember the events. This is very similar to getting Unitas from the blind side. It's not guaranteed to make you too popular and, friend, next time look out!

A helicopter pilot, part of a detachment, had occasion to make a run to the beach. The air station to which the pilot was going was familiar to him. He had been there many times before and was knowledgeable with the layout of the station, traffic patterns, altitudes, approaches and the location of the helicopter pad. At the appointed time and place the pilot touched down, gear up, lifted back into a hover, dropped the gear, landed again and shut down. An abbreviated incident report was sent about two weeks later via the air station because there had been minor damage. The OIC of the detachment, in forwarding the report, commented that the pilot failed to complete the landing checklist and also that his attention had been distracted during the approach to the helicopter facility by aircraft taking off and landing on the duty runway – some distance away. He further commented that the tower did not request a gear check and that there was no LSE at the helicopter pad for the landing.

When the air station received the report for comment it was the first indication that an incident had taken place. Although the investigation was hindered in reconstructing the facts (the ten day retention period for tower tapes had expired) air station personnel did establish that the particular helicopter had been aboard twice in a three day span. On the second occasion, three days after the date of the incident report a witness stated, "He touched down tail first, rocked forward on the fuselage, gear up. Then he lifted, lowered the landing gear and landed again. Someone got out and looked at the bottom, then got back in and the pilot taxied up to the building."

It really is immaterial *when* the incident occurred or *how many* times but what is important to aviation safety is *why*. The apparent failure of the pilot to advise the tower (located out of sight of the helo pad) of the incident and the length of time for the report to be routed via the air station for comment prevented use of what might have been an excellent source of information – the tower tapes. The business of accident investigation and accident prevention depends on the complete, candid reporting of facts. Anything which prevents the complete consideration of all the facts could on the one hand render useless the time and efforts of investigators and on the other hand could result in a key fact not coming to light. In this incident nothing was reported that will help to solve the eternal problem in aviation of why pilots fail to lower the gear before landing.

Many suggestions and ideas – hundreds – have been proposed to eliminate this boo-boo. There are checklists, horns, lights, aural admonitions, wheels watches, copilots, flight engineers, automatic sensors which drop the gear when power is reduced and airspeed reaches a safe speed but in spite of all these reminders pilots still manage to circumvent them and unintentionally land gear up. The best way to avoid wheels-up landings of course is to use the checklist – the last time, the next time, every time.

Sob!

AN SH-3A incurred minor damage when a plane captain (while rustlicking the No. 2 engine) allowed the rustlick to enter the No. 1 engine which was fired up. The rustlick caught fire and was blown back and up into the transmission area and, to

compound the problem, a faulty valve on the rustlick applicator continued to feed the fire after it had started. *That's similar to using a match at night to see how much gas is in the tank.*

All Rise

BRETHREN, the gospel today is taken from the second chapter of the C-54 NATOPS, Before Takeoff Checklist, seventh verse – challenge: flight controls; reply: unlocked and free.

Glory be to thee, O NATOPS.

Now it came to pass in the land of daily cumulus clouds, palm trees and warm seas that the plane commander of a C-54 was charged with the responsibility for a flight.

The great silver beast had been made ready by the host for the flight and great was the anticipation of the passengers for the journey.

The sun had hid behind the hilltops and darkness encompassed all the land.

As the aircraft roared down the runway on takeoff the pilot attempted rotation by pulling the yoke aft but was unable to get the desired position. The controls had been free during the check before takeoff.

By virtue of much experience in flight matters and being unable to abort without rolling off a cliff the pilot was able to rotate the plane by use of trim tabs.

The beast responded and leaped into the air. After many hours on his way to a distant place the pilot was faced with a landing.

The approach was conducted in a flatter than normal path and when it became time to flare, the yoke was brought back as far as the restriction permitted and the tabs again were used to establish the correct landing attitude.

There was great rejoicing after touchdown that a waveoff was not necessary.

The beast was secured at the end of the journey and the flight crew with the help of other technicians made a thorough inspection at the base of the control column.

They discovered *18 assorted nuts, bolts, washers and pieces of wood* which were promptly removed so that the control column was no longer restricted.

The plane commander and passengers gave thanks for their safe passage and invited many guests to a great feast in celebration thereof.

Amen!

Fuel? Whazzat?

A PROCEDURE many helicopter pilots use to check their fuel gages is to dipstick the tank(s) after many flights to compare what amount the gages show against what amount is actually on board. This procedure won't guarantee that the pilot who uses it won't be faced with fuel starvation but it will guarantee he won't flame out due to lack of fuel *without knowing about it*.

A CH-46 pilot was assigned to ferry a bird to another base about 10 miles away. On turnup his fuel gages showed 750 pounds but both fuel caution lights illuminated. A call had already been placed for fuel but before the fuel truck arrived the pilot elected to depart.

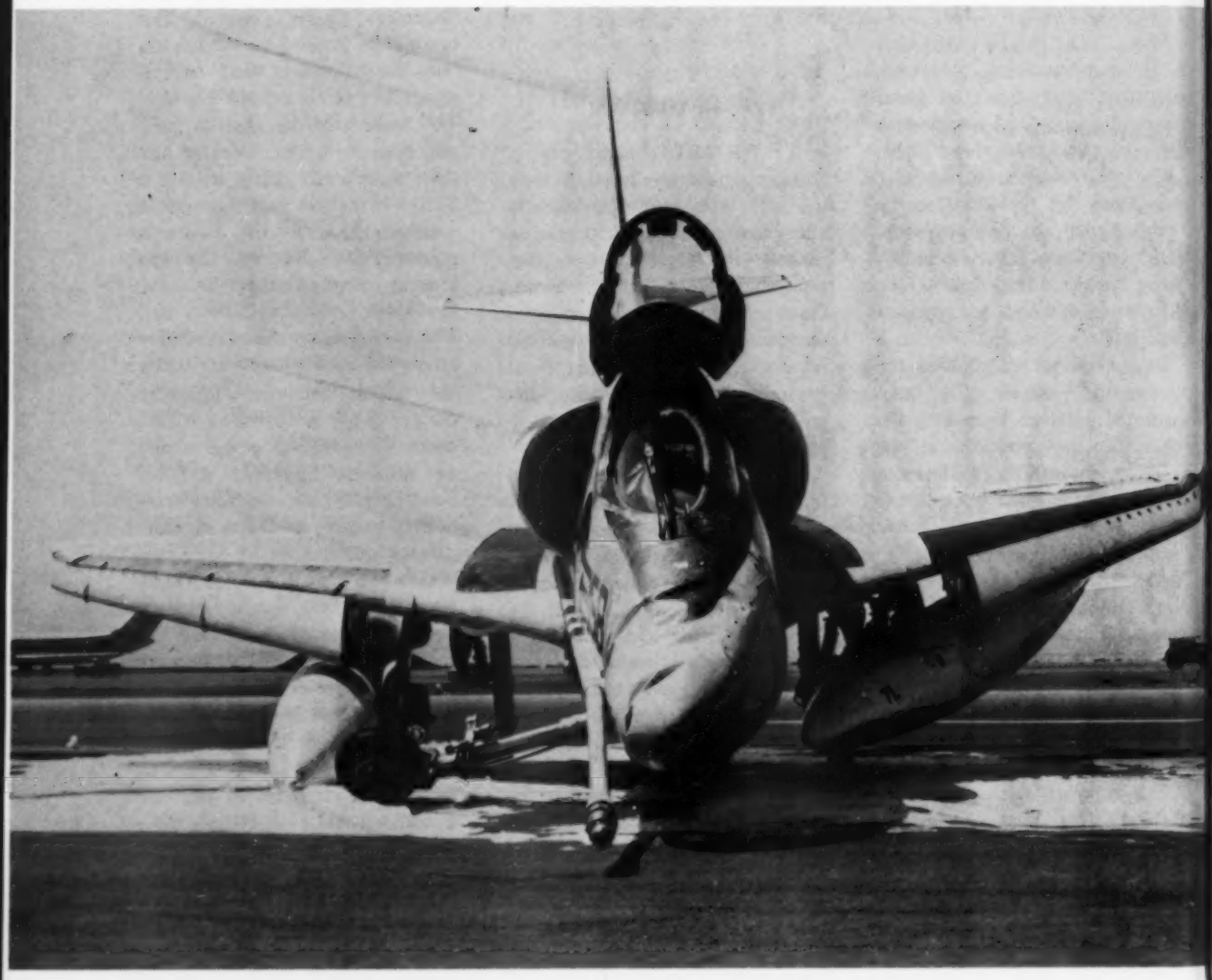
He made it – with a couple of seconds to spare. Both engines flamed out at touchdown. The gages read 350 pounds but the tanks were dry.

If you had to compete with smart, thorough, conscientious, careful pilots in your outfit what would you do? I would read and heed the article, "Fuel Starvation" in the March '71 issue of APPROACH – *again!*

Wait One

0400 aboard a carrier may not be so quiet and peaceful as the majority of folks would believe. On this particular morning a helicopter flight deck handling crew was preparing to push the helo onto the No. 2 elevator. It was raining as the ship maneuvered in a port list with 40 knots of wind across the deck. If everything had worked out all right this short tale wouldn't be told. As you might guess things kind of got out of hand. After the helicopter was straightened out heading onto the elevator it began moving when movement was not desired. The brake rider jumped on the binders but the helo continued to roll slowly but surely toward the edge. The brake rider decided to jump out, since it wasn't Saturday and there wasn't any reason to take a bath, but he was knocked somersault-like by the starboard main mount and was followed almost immediately by the helicopter into the safety net. The wingwalkers unsuccessfully attempted to throw chocks under the wheels and the deck edge coaming was knocked down – nothing was going to stop this runaway bird until it rolled into the net. Later the ship's crane hoisted out the helo with no more damage and the brake rider was stitched up, having suffered a nasty cut on the heel. An investigation determined that the brake rider had remained with the helicopter until the last second or two (skid marks ended 18 inches from the edge) and also that the deck edge coaming was not properly pinned. The C.O. of the ship commented that the conditions under which this move was attempted were not *normal* and good judgment should have dictated the use of a tractor. He also took steps to ensure that the retaining bolts are inserted when the coaming is raised. ◄

DOUBLE JEOPARDY

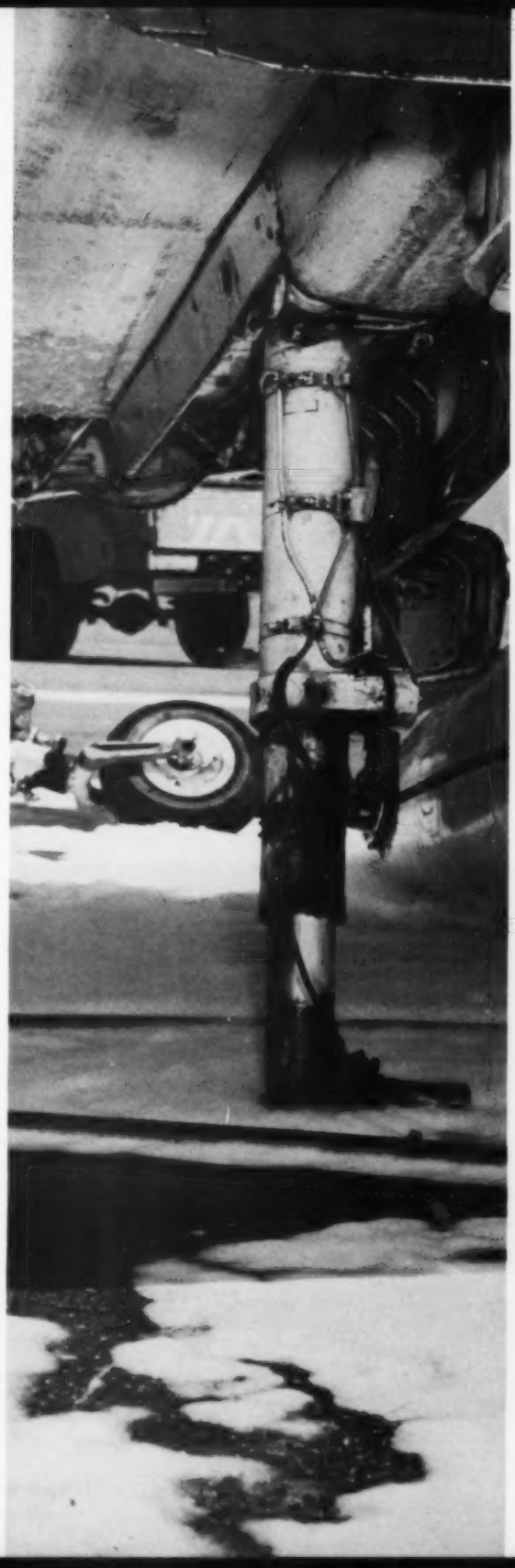


THERE are times when a pilot runs into more than one problem when an aircraft malfunction occurs. The aircraft mishap described below is one such example. The pilot's aircraft had a generator failure but the mishap was caused by the loss of the starboard main landing gear wheel and tire assembly at touchdown.

The pilot of a TA-4B departed IFR from NAS Somewhere enroute to an AFB. Shortly after takeoff the aircraft experienced a generator failure. The pilot deployed the ram air turbine and decided to divert to NAS Anyplace which was located nearby and had the capability to effect repair of the generator. The pilot notified Center of his intentions and canceled his IFR flight plan. He then contacted the control tower at the divert field, advised them of the generator failure and asked them to notify appropriate base maintenance personnel concerning his problem. The pilot then commenced dumping fuel to reduce aircraft weight for landing. With about 2000 pounds of fuel remaining, dumping was terminated and the aircraft entered the downwind leg of the landing traffic pattern.

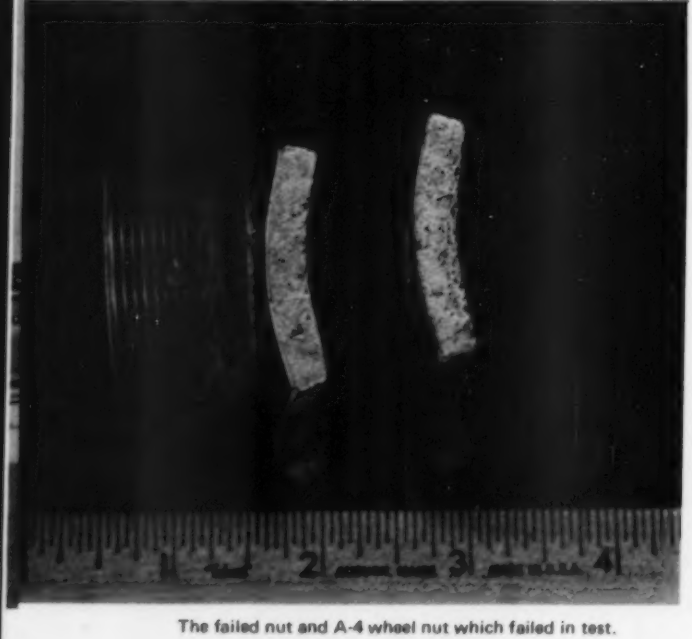
The approach to the landing continued and was, in all respects, normal until touchdown which occurred 57 feet from the approach end of the duty runway. After traveling about 25 feet the starboard main landing gear wheel and tire assembly departed the aircraft. The *Skyhawk*, spewing sparks in all directions, continued down the runway centerline some 2000 feet. At that point, the starboard main landing gear strut and axle engaged the E-15 arresting gear pendant causing the aircraft to swerve violently to starboard and then skid sideways to port. The extreme swerving and skidding resulted in the port wingtip dragging on the runway as the aircraft turned in a relatively tight arc to starboard. The nose landing gear then failed at the upper attachment fittings, tearing loose from and destroying the attachment fitting structure. Following this failure the nose section of the aircraft, the inflight refueling probe and the port external fuel tank contacted the runway. This resulted in extensive damage to the port wing and nose structure assembly. The ASQ-17 package also sustained impact damage.

The AAB (Aircraft Accident Board) was notified and they commenced their investigation by conducting a search of the area adjacent to the runway for the wheel and other parts of the aircraft. This produced an outer wheel bearing, a wheel grease seal and retainers, an A-4 wheel dust cover, a key type bearing washer similar to



The failed nut showing failure surface.

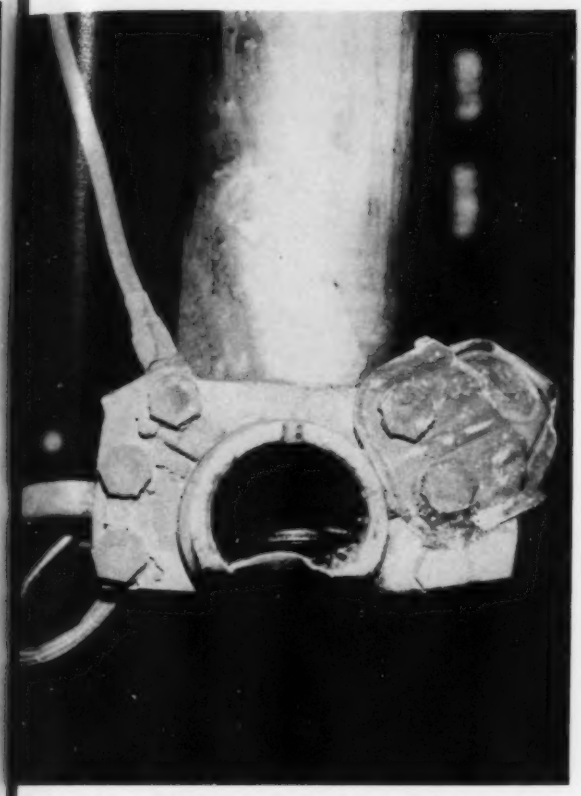
Surface of the damaged lock tip.



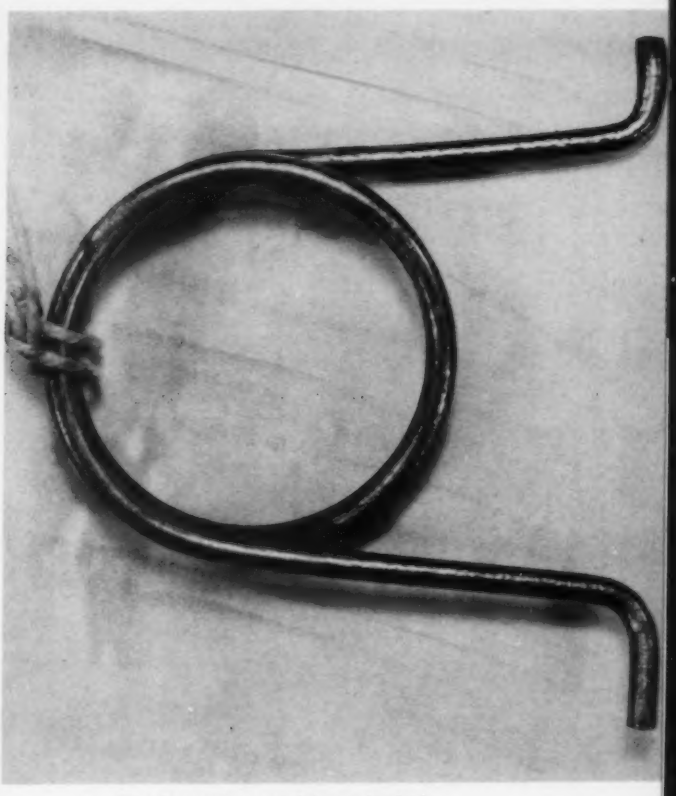
The failed nut and A-4 wheel nut which failed in test.

that used in an A-4 wheel installation, two dust cover retainer clips from an A-4 and the hex head of a nut resembling the kind used to retain the wheel on the axle in A-4 aircraft. The tire and wheel assembly were never located.

The hex head of the failed nut was convex (dished in) towards the threaded shank part of the nut. It did not resemble any nut used on naval aircraft because of this distortion, but was similar in size to the type used on A-4 aircraft. The Board decided to investigate this more fully. An A-4 wheel retaining nut was failed by the local NARF, using a hydraulic press, and it displayed the same convex appearance as the one in the possession of the AAB. This would indicate that the nut head was an A-4 wheel retaining nut and because of the location where it was found was in fact the one involved in the mishap. Examination of the axle nut retaining spring lock revealed that one of the locking tips was 1/8 inch shorter than the other and evidenced heat discoloration perpendicular to the length of the tip, whereas the failed surface was on an angle to the length, as though sheared between a rotating and a stationary surface. The extreme tip of this shear appeared to be abraded, as would have



The starboard landing gear axle showing nut retainer spring lock.



The damaged nut retaining spring lock.

occurred while the axle was sliding on the surface of the runway. In analyzing the failure surface, it was noted that if the failure did occur in a shearing action, it most probably would have been caused by rotation of the nut within the axle. If the spring had been installed properly in the nut and then aligned with the lock holes in the axle, both tips should have been sheared and the forces required to accomplish this would have been considerable. However, if only one locking point was installed in the nut and then aligned with the wheel bearing washer keyway in the axle instead of the lock holes, the shear forces could build up readily by forced movement of the nut by the wheel during landing.

Examination of the maintenance history for the aircraft revealed that the starboard wheel and tire were changed one month before the mishap. The aircraft had completed eight takeoffs and seven landings prior to failure on the eighth landing.

In summary, the type of failure sustained by the nut indicated a lateral force, without rotation involved, which caused the nut to fail outward in a typical tension type shear. This occurred as a result of an improperly installed wheel which permitted the wheel to move laterally on the axle during takeoff and landing. The forces imposed in landing with a loose wheel, especially in a crosswind, would permit intermittent, lateral pounding of the wheel against the bearings and transmit these forces evenly against the wheel retaining nut, producing the type failure involved in this mishap.

Based on the facts revealed during the investigation, the AAB concluded that the primary cause of the accident was maintenance personnel error in the installation of the starboard main landing gear wheel assembly, the main landing gear retaining nut spring lock and in the post installation QA inspection performed.

The AAB is to be commended for the manner in which the investigation was conducted. This mishap could surely have been recorded as material failure, cause undetermined, had the Board not conscientiously searched for reasons. This is the type of aircraft accident investigation which can't help but lead to improved naval aviation safety.

The mishap resulted in the loss of a TA-4B. Fortunately, the pilot came through the ordeal uninjured but more than a little unnerved. Double jeopardy in any form is plain bad business! ◄

UNEASY RIDER

THE RA-5C was on a night IFR flight plan from NAS South to NAS Mid-Atlantic with a practice tacan penetration to a missed approach programmed for NAS Enroute. ATC advised the flight crew that a line of thunderstorms lay across their filed route and the flight was rerouted. Pitot heat and engine anti-ice were turned on when precipitation was encountered about 75 miles from the IAF (Initial Approach Fix) for NAS Enroute. The aircraft entered holding at the IAF passing through FL 280 in a descent from FL 330 to FL 240, still encountering precipitation. The aircraft started vibrating severely and the pilot went to military power; vibration ceased momentarily and then began again. The instruments indicated 10-11 units angle-of-attack, 260

kias, 20-25 degrees starboard bank, with an altitude of FL 270/280. Both tachometers indicated military power but EGTs were not noted.

Suddenly, the angle-of-attack needle rotated above 20 units, the rudder shaker cut in and airspeed started decreasing rapidly, finally indicating ZERO. The altimeter began to unwind and maximum afterburner was selected on both engines with good ignition. The angle-of-attack indicator now indicated a slightly nose-high attitude but the VSI was pegged full down, the bank angle had increased to 65-70 degrees right wing down – but the turn and slip indicator was pegged to the left. Approaching 16,000 feet, the airspeed started to increase but the aircraft would not respond to forward or aft stick movements. Power was reduced to idle when the airspeed reached 500 kias. Now the aircraft would not respond to lateral stick movements but did respond to back stick and recovery was initiated at about 14,000 feet. Final recovery and level off was at FL 180 using the vertical stabilizer and lateral trim to roll wings level. The flight controls were checked and responded correctly to all stick movements for the remainder of the flight.

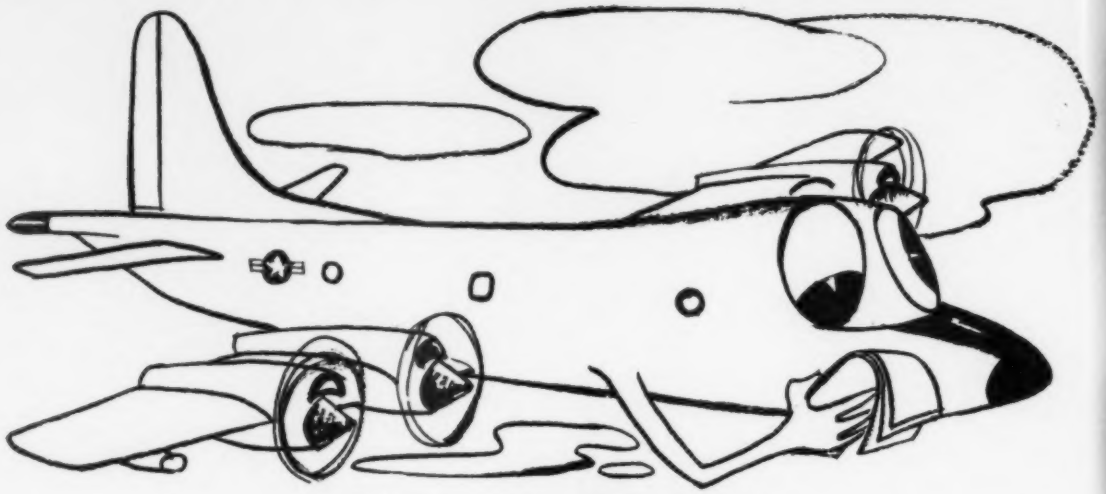
An immediate landing at NAS Enroute was not considered feasible due to the local weather and the flight proceeded to NAS Mid-Atlantic. After touchdown, the aircraft swerved to the right on the wet runway but was recentered and the arresting gear was engaged.

Icing of the pitot system probably accounted for the inaccurate airspeed indication since the pitot heater was found to be operating intermittently. The turn and slip indicator worked correctly when checked. The aircraft was in precipitation during its descent to and while in the holding pattern and it is suspected that the visible moisture was supercooled to such an extent that ice quickly accumulated on the aircraft. This extra drag caused the rapid rise in angle-of-attack and induced the partial loss of control. Flight control response returned with increased airspeed and the lower altitude.

The commanding officer commented on this incident:

"Considering all the known factors, which include: night, instrument flight conditions, a pilot with less than 74 hours in type and 608 total flight hours, this pilot demonstrated sound, positive procedures in recovering his aircraft from a very precarious condition. In retrospect, the pilot should have attempted to avoid the area of precipitation or have requested a descent below or a climb above the area of probable icing.

"All flight crewmembers will be given a thorough review of instrument flying conditions and techniques to be employed when icing conditions are suspected or encountered." ◄



P-3 Approach Plate Holder

THE OTHER day I went out to my brand new P-3C, strapped in and leapt off into the blue, only it wasn't so much blue as it was dark grey. Night came and time to go home. Everything was zero zero except Blank AFB which had several unfamiliar and rather complicated non-precision approaches available. "Ah, dear copilot, please dig out the approach plate books and we will go visit the Air Force tonight." I asked the copilot to watch over Oscar the friendly autopilot while I studied the various expected approaches. Approach control was contacted and I took the aircraft (now, where to put the approach book?) and commenced the various speed, altitude and heading changes which were required. New ATIS (Automatic Terminal Information System) info indicates a change in runway in use (oops, forgot to study that one). Approach control advises, "Cleared for___Two to Runway___." Then follows a mad search for the approach book. Ah! Found it on the deck... vertigo... copilot has the aircraft... but he doesn't have the approach book so that he can read it. Now, "I have it back!" Let's see now, one eye for the instruments, one for the new approach... oops, busted those minimums! "What's that about VOR No. 2?" "No, copilot, the frequency was 305.6, not .7. Did you get a VHF backup frequency? No VHF?" Can't read that approach plate stuck between the glareshield and the windscreen, so where do I put it? Engine problems on No. 4... oops, overshot that radial. Got to correct quickly... approach plate fell off my knee, where did it go?

So there you have it! How come this 7 million dollar aircraft doesn't have someplace to put the approach plate book where it can be read while making an approach?

Greencard Mouse

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. These reports need not be signed. Self-mailing forms for writing Anymouse Reports are available in readyrooms and line shacks. All reports are considered for appropriate action.

REPORT AN INCIDENT, PREVENT AN ACCIDENT

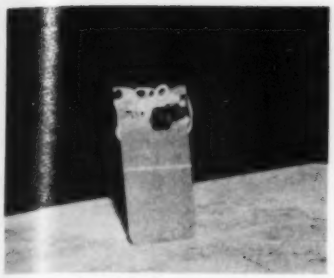
We sincerely hope that not many P-3 pilots have this much difficulty managing the approach plates during an IFR approach. Even so, it is recognized that a good approach plate holder is a very valuable piece of equipment.

Page 46 of the August 1968 APPROACH contained a letter (and three photos) from the Commanding Officer, VP-28, which provided details of a P-3 approach plate holder. This letter and photographs are reprinted here for the benefit of Anymouse and other interested P-3 pilots:

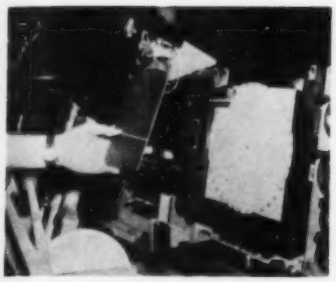
FPO, San Francisco, Calif. – LT Steve Martin, the Squadron Quality Assurance Officer of VP-28 has developed an excellent approach plate holder which is depicted in photos 1, 2 and 3. The proposed holder has the following advantages:

a. It is easily mounted. The arm on the top left side of the holder fits over the windshield wiper drive rod and the right side of the holder device incorporates interlocking flanges that fit securely on the underside of the glareshield.

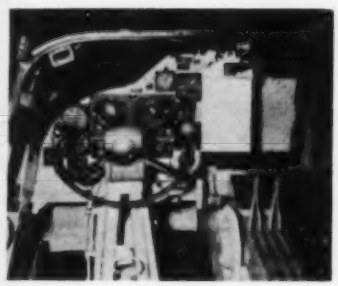
b. The mounting is rigid and not susceptible to swaying or movement in the event turbulence



1



2



3

is encountered.

c. The designated holder does not interfere with the power levers in the full forward position nor actuation of the windshield wipers or yoke movement.

d. The light mounted on the clip is a plotter floodlight with a wire lead that is plugged into the presently installed plotter light receptacle. The light is rheostat controlled and can be utilized with either white or red light and the light intensity can be controlled as required or desired by the pilot.

A number of other approach plate holders are known to have been designed by other P-3 squadrons. All P-3 squadrons are invited to submit designs to CROSSFEED, Naval Safety Center. A synopsis of all designs submitted will then be printed in a future issue of CROSSFEED.

Too Close For Comfort

THIS near calamity occurred over a year ago, since which time I've completed two full cruises. I was on my first carqual with a nugget pilot in the F-4 and was enthralled at the thought of landing aboard a carrier but, most of all, being shot off the front end. Numerous FMLPs had been conducted and both the pilot and I were ready for the ship. After a rigorous and thorough briefing at NAS Eastcoast the *green crews* manned aircraft and flew to USS BOAT.

Before the first cat shot of my career I was curious as to how it would be and where to put my hands – over my head near the face curtain or down near the alternate ejection handle. "Near the alternate ejection handle," came the replies.

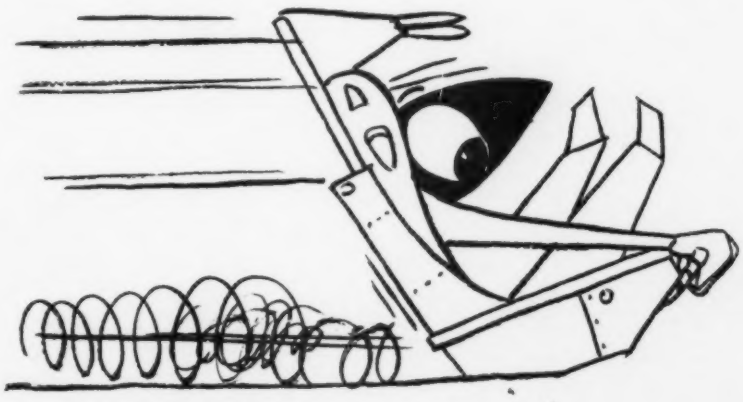
So there I was being taxied over the shuttle, checklists completed, and the firmest grip on that alternate ejection handle ever imaginable, like almost white knuckles. "Are you ready?" asked the pilot. "Ready!" said I, assuming the slouch position, not realizing how important proper body position is and never dreaming of an ejection situation.

On the initial part of the stroke I was thrown back against the seat and pulled the alternate handle out about two or three inches. Fortunately it wasn't enough to blow the canopy or eject me (and the pilot too since the command eject handle in the rear cockpit was out) and lose the Navy an airplane. I stowed the handle back and completed the rest of the carqual period.

Body position is important whether you're a nugget or a pro since an ejection may occur at the most inopportune time. Hand placement is important in regards to getting out of the plane. Everyone has to have their own norms to follow. This incident was not a norm and since then my hand is near the alternate handle, not *choking* it.

Slouch Mouse

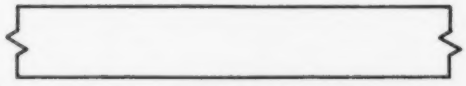
Another inch back on that alternate handle and the RIO and pilot could have gotten a real bang out of this cat shot. The Eastcoast F-4 RAG recommends that if you must hold onto something while riding in the rear cockpit use the hand grip over the instrument panel.



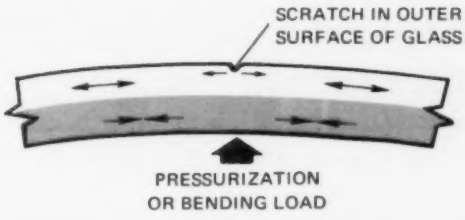
RADAR

LAMINATED GLASS WINDSHIELD PANELS

Adapted from an article by
Charles Gooch, Editor
Orion Service Digest
Lockheed California Company



A SECTION OF NORMAL PLATE GLASS UNDER STATIC CONDITIONS. NO LOAD AND NO STRESS.



B SECTION OF NORMAL PLATE GLASS SUBJECTED TO STRESSES CAUSED BY PRESSURIZATION OR BENDING LOAD. LOAD PLACES OUTER SIDE OF GLASS IN TENSION AND INNER SIDE OF GLASS IN COMPRESSION. SCRATCH, ACTING AS STRESS RISER IN SURFACE OF GLASS UNDER TENSION, IS LIKELY TO PROPAGATE AND CAUSE FAILURE OF GLASS.

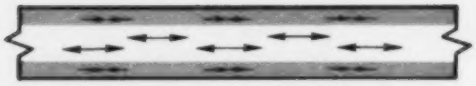
Figure 1.

Sections through an Annealed Glass Pane

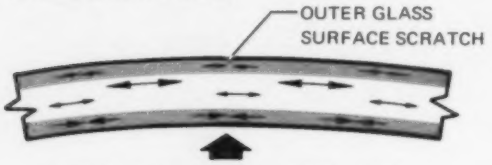
GLASS, because of its many desirable properties, has probably been the material most commonly used in aircraft windshield construction since the advent of cockpit and cabin pressurization. However, glass is extremely brittle. It has a relatively low strength-to-weight ratio when used for purposes such as window panels, and accurately contoured panels are costly and difficult to produce. For some time, glass was available only in the annealed state (see Fig. 1). In this form, panels with sufficient strength to withstand the aerodynamic and cabin pressurization loads imposed on aircraft windshields were prohibitively heavy. The development of tempering processes which permitted substantial reduction in thickness without reduction in strength or weight finally made the use of glass more practical (see Fig. 2).

Laminated glass panels were developed to impart shatterproof characteristics to the glass. Such panels are produced by laminating a ply consisting of several 0.025-inch thick clear polyvinyl butyral plastic sheets between plies of preformed and pretempered glass as shown in Fig. 3. The vinyl and glass plies are then bonded by application of pressure and heat; the temperature, below the bubbling temperature of the vinyl, is considerably less than that required for tempering the glass. Because vinyl has a natural affinity for glass, the bond is effected without the use of cement.

The development of laminated panels of tempered



A SECTION OF TEMPERED GLASS UNDER STATIC CONDITIONS. GLASS SURFACE LAYERS ARE IN COMPRESSION BALANCED BY TENSION STRESSES IN THE CORE.



B SECTION OF TEMPERED GLASS SUBJECTED TO STRESSES CAUSED BY PRESSURIZATION OR BENDING LOAD. APPLICATION OF LOAD VARIES THE INHERENT STRESSES OF THE TEMPERED GLASS (INDICATED BY THE SIZE OF THE ARROWS). A SCRATCH WHICH HAS NOT PENETRATED THE SURFACE COMPRESSION LAYER IS NOT LIKELY TO PROPAGATE, AS LONG AS THE BENDING LOAD TENSION STRESSES AT THE OUTER SURFACE OF THE GLASS DO NOT OVERCOME THE INHERENT COMPRESSION STRESSES.

Figure 2. Sections through a Tempered Glass Pane

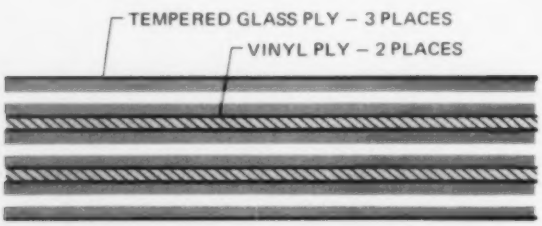
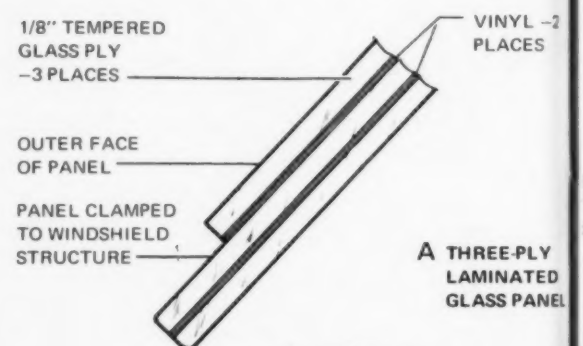


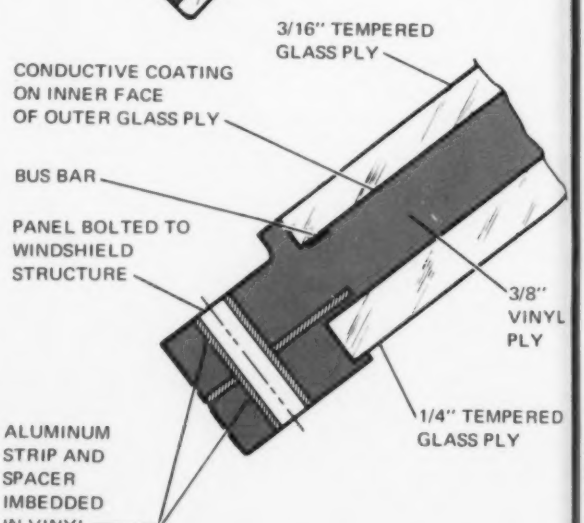
Figure 3. Section through a Laminated Glass Panel

glass and a vinyl plastic material was the starting point in the evolution of the present day electrically-heated, impact-resistant windshield. The windshield shown in Fig. 4A was representative of designs that immediately followed World War II. With the exception of sliding "clear vision" windows, these panels were made up of three plies of 1/8-inch tempered and polished plate glass, laminated with two thin plies of polyvinyl butyral. The sliding panels consisted of two plies of 3/16-inch tempered glass separated by a single thin ply of vinyl (see Fig. 4B). All the windshield panels were clamped to the windshield frame from the inside with retaining strips. From the maintenance viewpoint, this method provided a comparatively trouble-free installation with adequate reserves in structural strength. Nevertheless, it offered little protection against midair collisions with birds. To put it in technical jargon, this windshield installation was not designed to be "birdproof."

Early birdproof windshield panels were similar to the example shown in Fig. 4C. They were much thicker overall than previous designs due primarily to a 3/8-inch thick center ply of vinyl sandwiched between 3/16-inch thick outer and 1/4-inch thick inner tempered glass plies. The resistance of the panel to bird strike impacts great enough to shatter both glass plies (see Fig. 5) was derived from the ability of the vinyl ply to absorb the shock load by stretching and deforming. To ensure this resistance, it was essential that the vinyl be held around the edges with more security than the clamping action of previous designs provided. Therefore, the vinyl ply was bolted directly to the aircraft structure. To further refine the design and provide even more installation security, an aluminum insert was imbedded in the vinyl around the periphery of the panel and an aluminum spacer was installed in each bolt hole (see Fig. 4C). This construction prevented deformation of the vinyl ply at



A THREE-PLY LAMINATED GLASS PANEL


3/16" TEMPERED GLASS PLY
CONDUCTIVE COATING ON INNER FACE OF OUTER GLASS PLY
BUS BAR
PANEL BOLTED TO WINDSHIELD STRUCTURE
3/8" VINYL PLY
1/4" TEMPERED GLASS PLY
ALUMINUM STRIP AND SPACER IMBEDDED IN VINYL

C EARLY HEATED BIRDPROOF PANEL

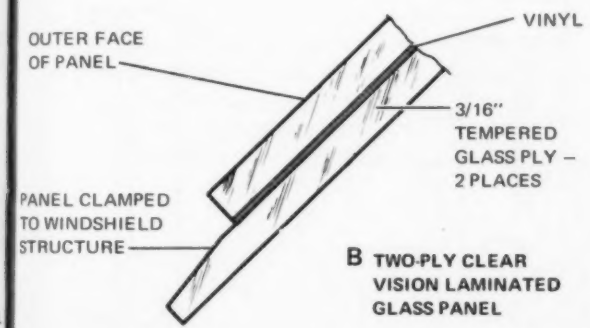
Figure 4. Sections throu

the panel edges during installation and under pressurization loads.

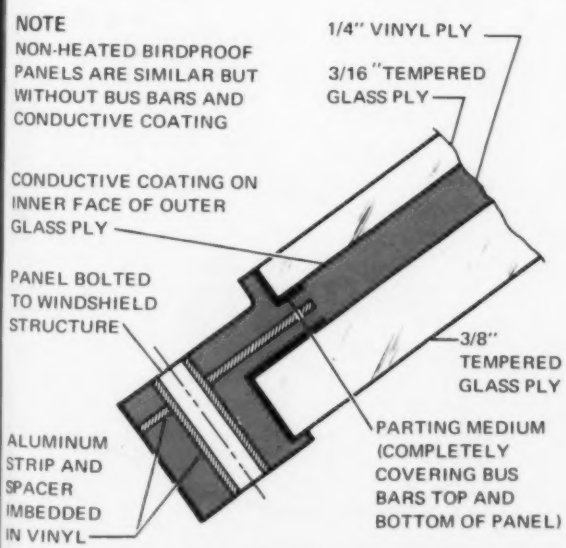
Development of the early birdproof panels was followed by development of a panel which could be electrically heated by means of resistance wires about 0.001 inch in diameter imbedded between the plies near the top and bottom edges of the panel. These were the forerunners of electrically-heated panels currently being used in military aircraft.

Heated panels of improved design feature, as a heating element, a transparent conductive coating of stannic oxide on the inside surface of the outer glass ply instead of resistance wires. This conductive coating, about 20 millionths of an inch thick, is called by the Pittsburgh Plate Glass Company trade name of "NESA," while similar panels manufactured later by the Libby-Owens-Ford Glass Company used the trade name "Electrapane." This approach to anti-icing has proved to be more successful than the wire-heating method.

There is an interesting sidelight to the development of



B TWO-PLY CLEAR VISION LAMINATED GLASS PANEL


NOTE
NON-HEATED BIRDPROOF PANELS ARE SIMILAR BUT WITHOUT BUS BARS AND CONDUCTIVE COATING
1/4" VINYL PLY
3/16" TEMPERED GLASS PLY
CONDUCTIVE COATING ON INNER FACE OF OUTER GLASS PLY
PANEL BOLTED TO WINDSHIELD STRUCTURE
3/8" TEMPERED GLASS PLY
PARTING MEDIUM (COMPLETELY COVERING BUS BARS TOP AND BOTTOM OF PANEL)
ALUMINUM STRIP AND SPACER IMBEDDED IN VINYL

D LATER HEATED BIRDPROOF PANEL

Windshield Panels of Earlier Design

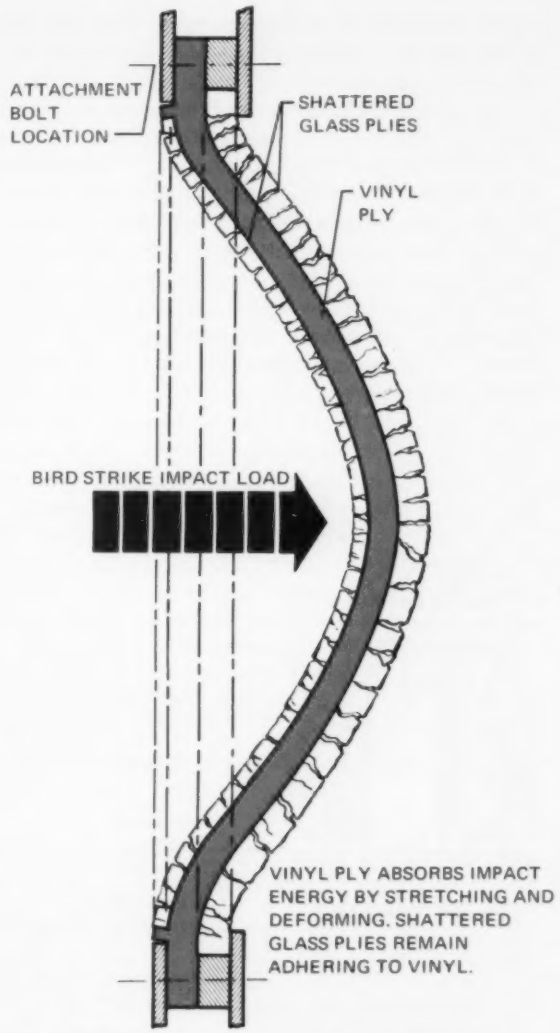

ATTACHMENT BOLT LOCATION
SHATTERED GLASS PLIES
VINYL PLY
BIRD STRIKE IMPACT LOAD
VINYL PLY ABSORBS IMPACT ENERGY BY STRETCHING AND DEFORMING. SHATTERED GLASS PLIES REMAIN ADHERING TO VINYL.

Figure 5. Manner in which a Birdproof Windshield Panel Resists a Bird Strike

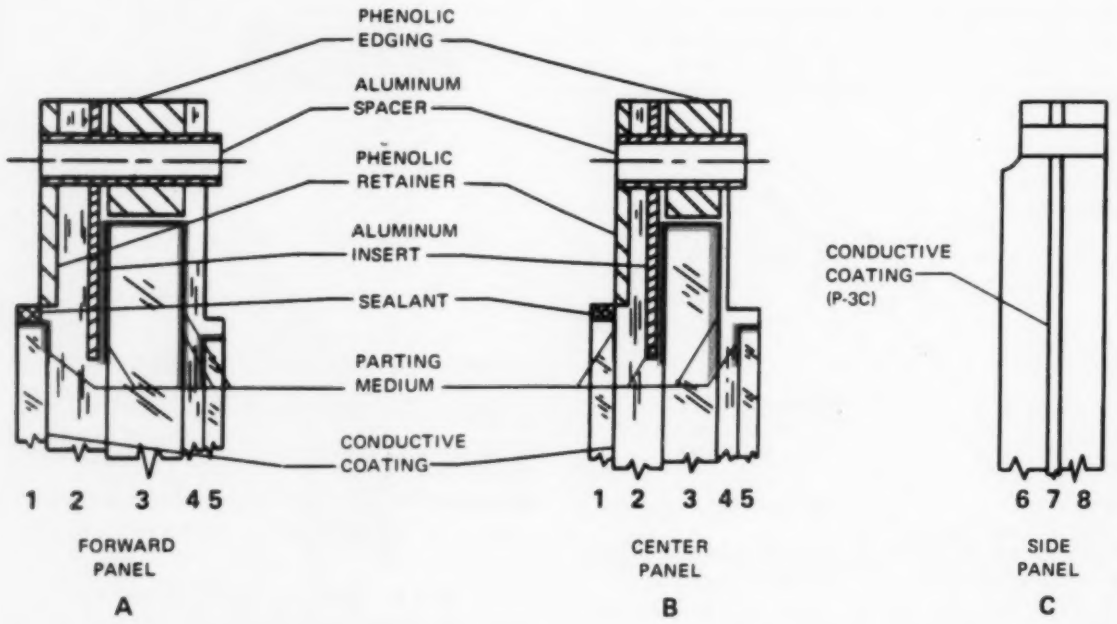
the original panel with a conductive coating. The trade name NESA is actually an acronym for "Non Electro-Static Formulation A." This term may seem even more obscure than the trade name until we delve a little further into history. Prior to World War II, aircraft speeds and operating altitudes had increased to the point where the buildup of static electricity in the windshield panels was becoming a problem. The original NESA panel with a conductive coating and a connection to ground was designed to meet this contingency. Some commercial airplanes used this device at that time and later it was fitted to several wartime military aircraft. Use of the same transparent coating as a heating element

was a subsequent development and nowadays all electrically-heated panels still provide this means for windshield static discharge.

Improved aircraft performance, in terms of higher speed and altitude, required parallel improvements in windshield design. The greater pressure differentials encountered at higher altitudes, and the need for panels of greater area, dictated the need for increased structural strength. Figure 4D shows that in the next evolutionary step, the thickness of the inner glass ply (the principal load-carrying member) was *increased* while thickness of the vinyl ply was *reduced* correspondingly so that the overall thickness of birdproof windshield panels remained the same.

Laminated glass panels were further strengthened by reinforcing the edges with cotton-pheonlic retainers and edging as shown in Fig. 6. Primarily, these reinforcements improve transfer of pressurization and bird-impact loads from the panel to the aircraft structure. In addition, they act as a "plug" around the panel edge, helping to prevent extrusion of polyvinyl butyral birdproof ply material during panel installation and to prevent flow of this material from the edge of the panel assembly during its service life. The insulating qualities of these cotton-phenolic reinforcements also tend to minimize heat transfer between the panel and the aircraft structure.

Another design refinement on electrically-heated



1 OUTER GLASS PLY - (3/16 INCH)

2 OUTER VINYL PLY (APPROX 0.290 INCH ON FORWARD PANEL; APPROX 0.265 INCH ON CENTER PANEL)

3 MAIN GLASS PLY (1/2 INCH ON FORWARD PANEL; 3/8 INCH ON CENTER PANEL)

4 INNER VINYL PLY (APPROX. 0.120 INCH)

5 INNER GLASS PLY (1/8 INCH)

6 OUTER ACRYLIC PANE (0.660 INCH)

7 INTERLAYER (APPROX. 0.163 INCH VINYL OR CAST-IN PLACE RESIN)

8 INNER ACRYLIC PANE (0.660 INCH)

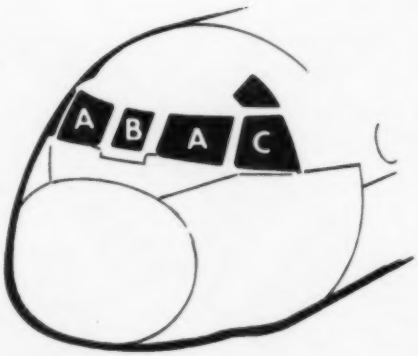


Figure 6. P-3 Windshield Configuration. Sections through Forward, Center, and Side Windshields

panels incorporated a parting medium around the panel edges between the glass and vinyl plies. The parting medium allows a slight amount of movement between the glass and vinyl plies at a point where the panel is subjected to flexing under pressurization loads. It also relieves high shear stresses which can occur at the edges of the panel at very low temperatures. Use of the parting medium to allow these movements to take place without restraint has been found to be less injurious to the panel than extending the bond to the very edge of the glass plies. The parting medium also completely covers, and therefore protects, the bus bars located at the top and bottom edges of the panel.

Why electric anti-icing? In the proceeding chronological discussion on the development of electrically-heated windshields this rather obvious question has been purposely avoided. One might well question the advisability of developing a somewhat complicated method of electrical ice prevention for the windshield, when other well-tried methods such as the use of alcohol spray or hot air might accomplish this with less trouble.

Electrical heating of laminated glass windshields provides more than just a desirable anti-icing feature; it also maintains plasticity of the vinyl plies of the panel. The physical properties of the vinyl plies vary considerably with changes in temperature. Considering the range of ambient temperatures that could normally be encountered during an extended flight, the vinyl would be quite brittle in the lower part of the temperature range and quite plastic in the upper part. Panel temperature is not so critical on most piston-engine aircraft, but it is more or less essential to heat the panels on the faster and larger turbine-powered aircraft to meet birdproofing requirements without restricting aircraft performance.

Since the desired birdproof characteristics (energy-absorbing ability) of a windshield depend to a large degree upon the plasticity of the vinyl, panel temperature is an important factor. The optimum temperature range for maximum energy absorption by the vinyl is between 80°F and 120°F. At lower temperatures birdproof characteristics of the panel decline rapidly and, depending upon the actual configuration, impact resistance can be reduced by 30 to 50 percent when panel temperature is still a quite moderate 60°F. Electrical heating has proven to be an effective means of maintaining the temperature of the energy-absorbing vinyl ply within the optimum range.

There you have it, the history of the development of laminated, electrically-heated windshield panels. The information has been presented to show, in one way, how progress is constantly being made to increase the effectiveness and safety of military aircraft. ◄

Tacan Tips

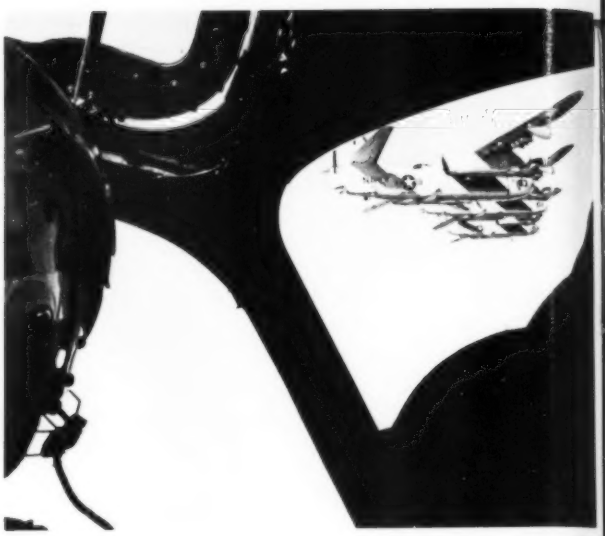
HOW often do you tune in a tacan station and accept any signal which will activate your receiver? Do you always check to make certain that you are clearly receiving the 3-letter Morse code identifier for your intended station? If not, you may be "betting your life" on a system which may or may not be providing the information you need to navigate safely. For example, are you, as a pilot, aware that regulations require that a facility's identifier be taken off the air when maintenance is being performed? Absence of the identifier could, therefore, be your warning that tests are being performed which would alter the signal beyond usable tolerance. Do you listen for this warning?

The identifier can also be a tip-off to another system malfunction – Adjacent Channel Interference. If one of two adjacent channel ground stations happen to be mistuned, the result will be a spill-over of azimuth signal. A garbled identifier, or a mixture of identifiers, should alert the attentive pilot to a possible degradation of tacan service. Sometimes it is the "little bit of knowledge" which is dismissed as trivial that can be a dangerous thing.

PERIODICALLY it has been our pleasure to feature a Navy or Marine squadron in the pages of APPROACH for outstanding operational performance. It is with pride that

The Naval Safety Center

SALUTES



VS-33

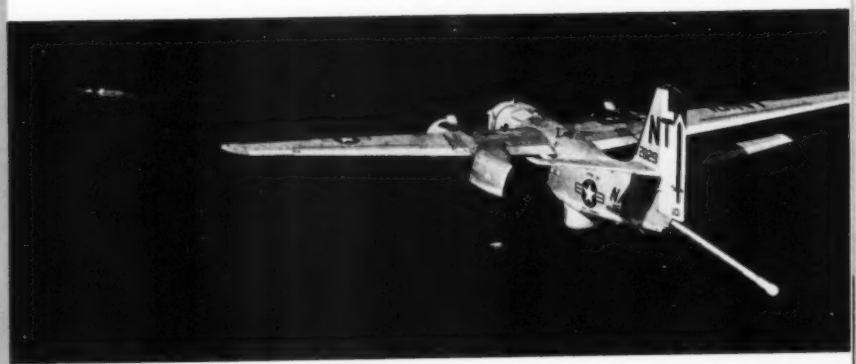
ommissioned in April 1960 at NAS North Island, Air Anti-Submarine Squadron THIRTY-THREE (VS-33) began a string of accident-free months in September of that year and has extended that string to over 124 months. In December 1970 the squadron passed *65,000 accident-free hours* and is still climbing!

The squadron has operated two series of the S-2: the S-2F from date of commissioning to June 1963, and the S-2E since then. They have operated from BENNINGTON, HORNET and TICONDEROGA and have completed four WestPac cruises – each deployment lasting six months or more. Additionally VS-33 has participated in many HUKASWEX for periods from four days to two weeks. Other interesting operations have included the Silver Anniversary exercises of the Battle of Coral Sea at Sydney, Australia and participation in the Apollo Space Capsule Recovery Forces.

VS-33, as one may assume, has received many honors. They have been the recipients of three COMNAVAIRPAC Battle Es, three ISBELL Awards, the CNO Safety Award and a Meritorious Unit Commendation.

Their secret of success can be attributed to an attitude and a way of life. Each individual is tasked with the responsibility of day-by-day active support of the squadron safety effort in all things and above all – professional performance. They have worked hard to achieve this magnificent record which is fitting testimony of the philosophy that safety is everybody's business.

A *Well Done* to you, CDR James R. Buckley, to all your predecessors and to all of the troops – past and present.



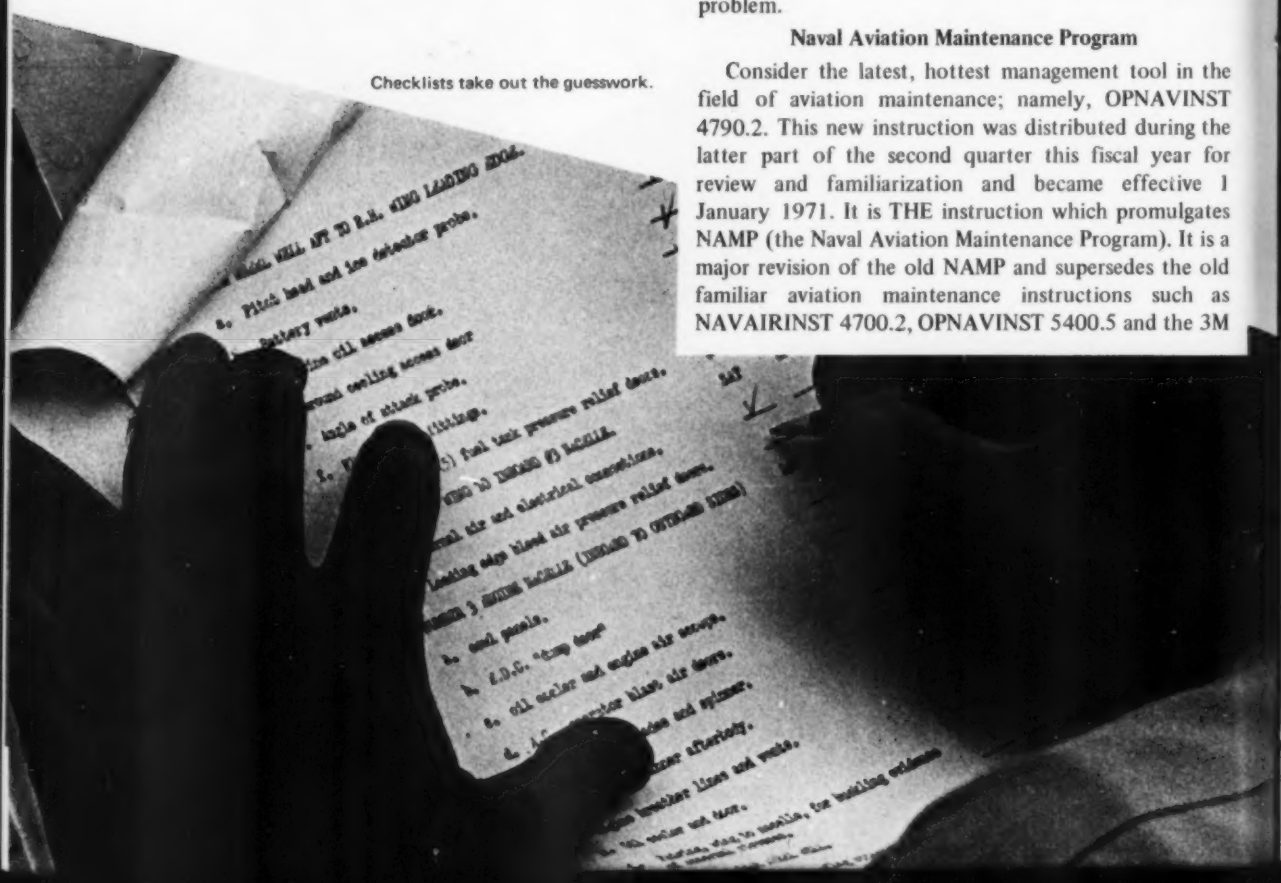
MAINTENANCE

A Key To Reduction In Aircraft Accidents

NAVAL aviation maintenance, long considered by many in aviation circles to be exemplary, is in trouble. Many reasons have been stated in casual conversations, in committee meetings and in correspondence attempting to explain the trouble. Some have said maintenance these days is too complicated; there are too many records to keep; there is too much administration. Others have said today's aircraft are too complex and by the time we have people trained we're too far behind to ever catch up. Still others have said the personnel we have to work with aren't interested in their work; they don't care about doing a good job. Many other explanations have been advanced but it is questionable whether any of them really provide the reason. Maybe there is some validity to all of them. Whatever the reasons, it is necessary to find answers that will solve the problem.

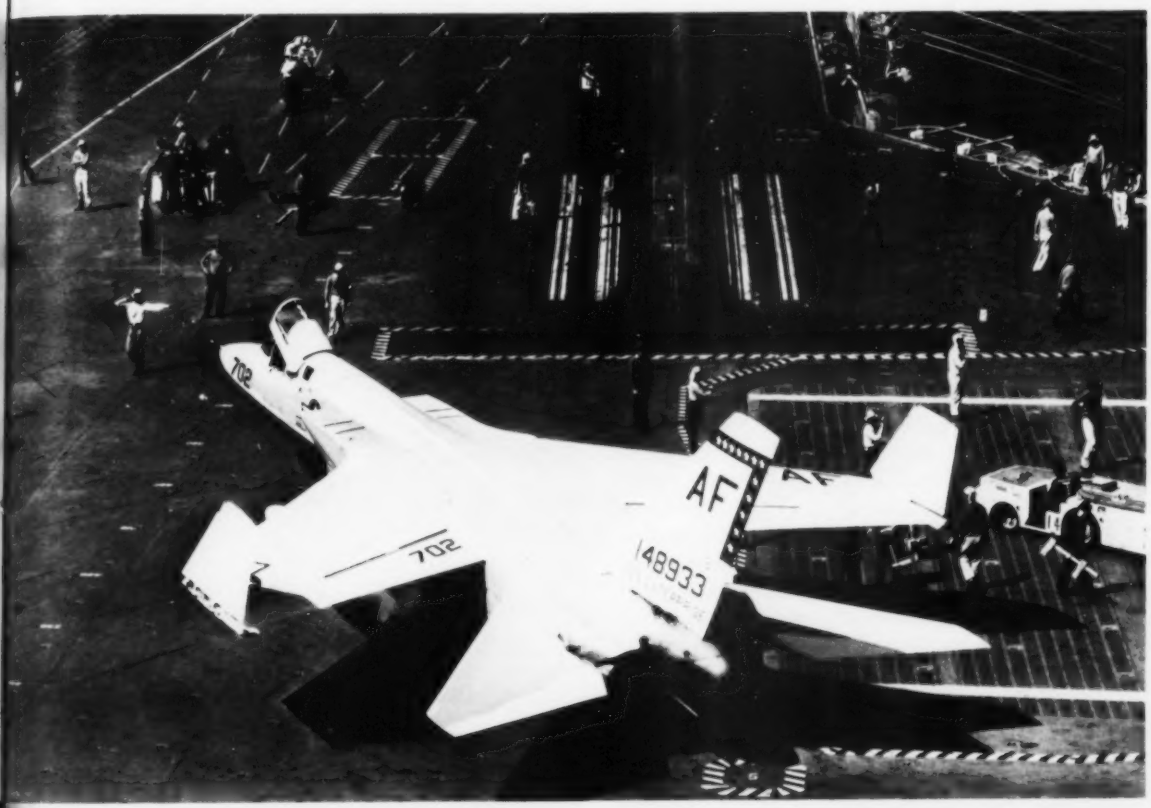
Naval Aviation Maintenance Program

Consider the latest, hottest management tool in the field of aviation maintenance; namely, OPNAVINST 4790.2. This new instruction was distributed during the latter part of the second quarter this fiscal year for review and familiarization and became effective 1 January 1971. It is THE instruction which promulgates NAMP (the Naval Aviation Maintenance Program). It is a major revision of the old NAMP and supersedes the old familiar aviation maintenance instructions such as NAVAIRINST 4700.2, OPNAVINST 5400.5 and the 3M



Checklists take out the guesswork.

E MANAGEMENT

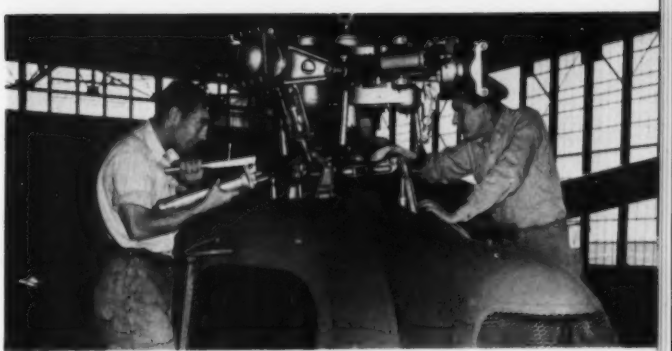


Supervision of qualified personnel gets the job done right.

manual. The new NAMP instruction is detailed, thick in size and complete in scope. It is written in four volumes; Volume I – Policies, Concept, Organization and Responsibilities; Volume II – Maintenance Support Procedures; Volume III – Maintenance Data Collection System; and Volume IV – Data Processing and Analysis. In less than two years the new NAMP instruction was conceived, directed, planned, written, coordinated, reviewed and published. This is a fantastic achievement.

Also during the past two decades other great changes have occurred to benefit aviation maintenance. These wide sweeping changes have included:

- The establishment of a formal NAMP, per se.



Some grease fittings are hard to find.

- Standardization.
  Maintenance organization on three levels.
  Allowance lists.
  Inspections.
  Ground support equipment.
  Handbooks.
  Aircraft custodians.
  Forms and reports.
- Revisions of support documents.
- Introduction of maintenance line items in contracts.
- Creation of maintainability and reliability specifications.
- Establishment of contractor support of new aircraft during the introductory stages.
- Innovations in provisioning.

Despite these changes and advances throughout the entire spectrum of maintenance, maintenance support and maintainability, a weak link in the chain of station/squadron maintenance exists. For example, *and in the interest of stimulating thought and discussion,* the weak link may lie in maintenance management. Maintenance management implies the total maintenance effort at the squadron/station level from the commanding officer through the AMO (aviation maintenance officer) down to the level of a two or three man operation where one of the two or three is in charge and exercises a degree of management over the other(s). What else is there in maintenance organizations, common to all, which permits such a varying degree of maintenance and material condition of assigned aircraft, appearance and performance of assigned aircraft and maintenance department inspection grades? What causes maintenance at one activity to be so poor that an inspection team would seriously consider recommending that all aircraft be grounded and yet another activity maintaining the same model, under similar operating conditions, is rated outstanding? Consider another example. What happens in the short span of one year to cause a complete "180" in the maintenance efforts of an activity? There are many cases in which a squadron or station has pulled itself up from unsatisfactory to excellent or the converse where some activities have taken a nose dive – all in the short time of about 12 months. When this has happened a ready explanation for such radical performance invariably points to a change in some key personnel. Coincidence?

Before pursuing further discussion of maintenance management it might be best to make certain assumptions. One may assume with a reasonable degree of accuracy that:

- The NAMP instruction (4790.2) is specific in promulgating maintenance policy, philosophy, organization, administration and duties.
- Each activity is *normally* assigned the ranks, ratings and skills necessary to perform all maintenance functions for assigned aircraft – perhaps not in the numbers desired but in whatever a fair share may be. (There is an open avenue, official letter through the chain of command, by which an activity can request either different numbers of personnel or different ratings and skills. There is also a move underway by which NECs are going to be refined to indicate more important information about an individual.)
- Each activity is organized according to what has been determined to be the best for that activity – even to the point where organizational deviations are permitted and authorized because of peculiarities in mission, location or for other reasons.
- Each activity has available sufficient allowances of tools, publications, ground and special support equipment to do the job. Although in the case of some squadrons it has been found that optimum utilization leaves something to be desired; e.g., at one station it was discovered that the AIMD had checked out two test benches to one squadron and another squadron of the same type was doing without any. Hard to believe but true.
- Most heads of maintenance departments and division officers have about the same "smarts" either from years of experience or formal schools. A quick review of the formal schooling available reveals that the Aviation Maintenance Officer School conducted by CNATECHTRA at Memphis provides excellent training for prospective aviation maintenance officers and for chief petty officers. It is a 16-week school divided into four phases. The full course provides four weeks of maintenance administration, two weeks of power plants,

Classroom sessions on a regular basis are money in the bank.

Let me show you the right way.

two weeks of airframes and eight weeks of aircraft maintenance and material management techniques. The school is tailored for prospective AMOs, maintenance assistants and key supervisory personnel.

If the preceding assumptions are reasonably accurate let's get to the nitty-gritty. What is a newly assigned AMO faced with? The first test of any manager is the ability to apply the knowledge, theory and techniques he has learned to the cold, hard facts of life with which he is faced in the operating arena after he has become "boss" and the shakedown period begins. Almost simultaneously with "getting a feel of things," he must find out what the policies of the C.O. are; he must get to know his division officers and key supervisors – their capabilities, qualifications and personalities; he must learn how demanding the operations and training officers are; he must determine how responsive the supply officer is. All of these are important to the maintenance effort before the AMO can effectively dig into the myriad problems of aviation maintenance. The fact that the AMO is usually the head of the largest department in the activity carries with it an axiom that he has the most problems – of all kinds. Being AMO is a severe test of knowledge, managerial skills, department (public) relations and plain old common sense. Some hack it. Some don't. Next to the C.O. the AMO, probably more than any other one individual in the activity, cannot afford to "lose the bubble." He must keep the big picture finely tuned because to get bogged down in any one area for any length of time may mean losing complete control. This applies as much to the AMO who becomes trapped by reports and

We'll test it on the bench first.

There may be a trend starting. Watch for it carefully.

administration to the exclusion of all else as it does to the AMO who becomes so involved with airframes problems that he has not sufficient time for power plants and avionics. To avoid these traps the AMO must use his activity organization and the talents of his specialists – division officers and key supervisors – to the maximum extent.

Management Is Important

Good, practical, sound management is needed to reduce the too-high accident rate caused by maintenance error. This type of cause factor in accidents varies greatly between activities but is the cause of 16 percent of all Navy accidents. This means for instance that in FY 70 about 70 aircraft were damaged or destroyed – losses which could have been prevented by proper maintenance. We know about these but what we don't know is how many others, classified undetermined, were also lost for the same reason. Perhaps over-simplification will result if an attempt is made to categorize maintenance caused accidents but the risk is worth it. These categories might include:

- Non-standard administrative procedures.
- Lack of supervision.
- Ineffective quality assurance.
- Questionable training.
- Less than optimum utilization of manpower, equipment and facilities.

Everyone of the categories mentioned is manageable, i.e., the AMO is in position to influence, control or eliminate them. The trend of maintenance oriented mishaps is rising in aviation operations and a reversal of the trend is of primary importance.

In the course of casual visits, safety surveys and formal inspections, several generalities hold true for those activities which impress the observer. The pros in the aviation maintenance business usually are those who run taut maintenance departments. They have established and insist on performance "by the book" (4790.2). This is not to imply they are so hard-nosed that they won't listen to well thought-out ideas but they have a department SOP and everything is done according to the SOP until a better way is determined and the SOP is changed. Firm but flexible. The successful AMOs, almost without exception, have a corps of active, positive supervisory personnel. These individuals are hard working members of the maintenance team. They are knowledgeable and interested because the AMO is in the same bent. It is also no surprise to discover excellent quality assurance, in the "good" outfits. Another yardstick which seems to distinguish the top maintenance departments is a continuing training program. The worst enemy of training programs – time – can easily be overcome by planning and executing small group training and it's surprising that it is only a few departments, rather than the majority, which take advantage of this opportunity to "put money in the bank." One other interesting point to note is the careful planning and scheduling (personnel, workloads, checks, meetings and reports) which is routinely accomplished by the top AMOs.

Instant Improvement?

So how do we reduce the percentage of accidents caused by improper maintenance which is what we're striving to do? We've discussed several ideas concerning the importance of good management, proper planning and scheduling, training sessions, supervision and good quality assurance. What has not been discussed are the all important attitudes and conditions which must prevail in any 4.0 organization. It is appropriate to comment on a few of them. The one attitude which stands out immediately in the best outfits is good *morale.* What sets this type of activity apart is the conviction by the majority of personnel that they belong to the best activity in the Navy. It is this type of activity where there is a readily apparent esprit-de-corps. Most personnel will also admit there is *positive leadership* – right from the "boss" on down. Evidence of this is found daily everywhere in the organization. The AMO, the division officers and key supervisors get off their "duffs" and roam around the hangar, shops and line to see what's going on, to lend advice or a hand if required and in general keep their fingers on the maintenance pulse. In activities, such as we're describing, most personnel take an *interest* in their work and *desire* to do the job right. They know that *recognition* will be given for a job well done and on those few occasions when a goof occurs they accept adverse comments with the attitude that "It won't happen again!" ◄

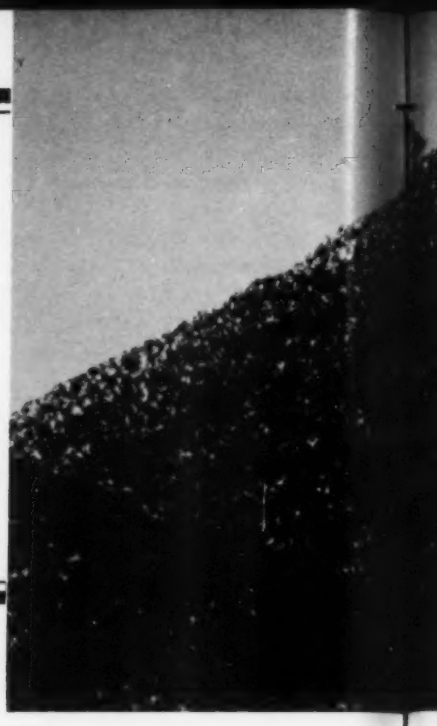
During the past two years representatives of the NAVSAFECEN have conducted many safety surveys. Listed below are observations and discrepancies, pertaining to aviation maintenance departments, which are repetitive. They have occurred in Navy and Marine squadrons, shore stations and ships. They are listed to indicate frequently discrepant areas.

- Safety committee meetings are either not held or are too irregular to be effective. Minutes of meetings are not published and no follow-up action is indicated.
- AMO has not had an indoctrination course in 3M and is not using analyses to spot trends.
- Quarterly planning board meetings are not held by the activity.
- AMO is not requiring check crews to review all outstanding gripes prior to an aircraft entering check and the check crew is not composed of appropriate ratings and experience levels.
- Maintenance Control does not have guidance on what constitutes UP or DOWN gripes. Maintenance Control does not reflect aircraft status at the beginning of working hours for work accomplished by night check.
- Housekeeping is poor in all areas – line, hangar and shops.
- CAMIs have been issued which have not been added to MRCs.
- TIMIs are being violated.
- Tool accounting is negligible.
- Unauthorized deviations from MRC decks.
- Supervisors are not screening MAFs.
- Accessory record cards are not kept up to date.
- Daily inspections and servicing of GSE is not being performed. Operators of GSE are not licensed or qualified.
- Fuel samples are not clearly marked to show which aircraft they came from.
- Preflights are being conducted without using MRCs.
- Aircraft in the hangar are not grounded.
- Hydraulic test equipment is contaminated.
- Technical publications are out of date – both in the central pubs office as well as in shop areas.
- Corrosion control is non-existent or inadequate.
- High voltage signs are not posted.
- Lox converters are not being purged.
- Disaster control bill is either not promulgated or not posted.
- Individuals do not know the location of the nearest fire alarm box.
- General non-compliance with directives.

Quality work begins with observing safety precautions, checking the book, loading by following ordnance SOP, being careful when handling lox and conducting briefings at various stages.

It's for the Birds

By John E. Berta



MILLIONS of dollars are spent each year to repair structural and engine damage to aircraft caused by bird strikes. There is serious concern with these costly and often fatal consequences. Research is being conducted on bird habitats and migration patterns with the hope of developing preventative and corrective measures. Knowledge on the part of pilots regarding bird habits may help to reduce this hazard.

Generally speaking the heaviest spring migration period is from March through April and the heaviest fall migration period from October through November.

The birds considered of greatest potential hazard to aircraft because of large size, abundance, or habit of flying in dense flocks are the whistling swans, Canada geese, blue geese, white-fronted geese, mallards, pintails, gulls, vultures, starlings and blackbirds. Birds of these species are considered particularly hazardous during spring and fall migrations and when they are concentrated in wintering areas. Swans make nonstop flights of several hundred miles (Chesapeake Bay to Lake Erie) at altitudes up to 6,000 feet. At some airports, there are large flocks of sandpipers, horned larks, blackbirds, tree swallows, longspurs, white pelicans, sandhill cranes, or other species which could be a problem at certain seasons.

The four major bird flyway routes within the continental United States are:

1. Atlantic Flyway – Chesapeake Bay, Back Bay area in Virginia, and the Currituck Sound, Lake

Mattamuskeet area in North Carolina.

2. Mississippi Flyway – The Mississippi Valley and the South Louisiana marshes along the Gulf of Mexico.

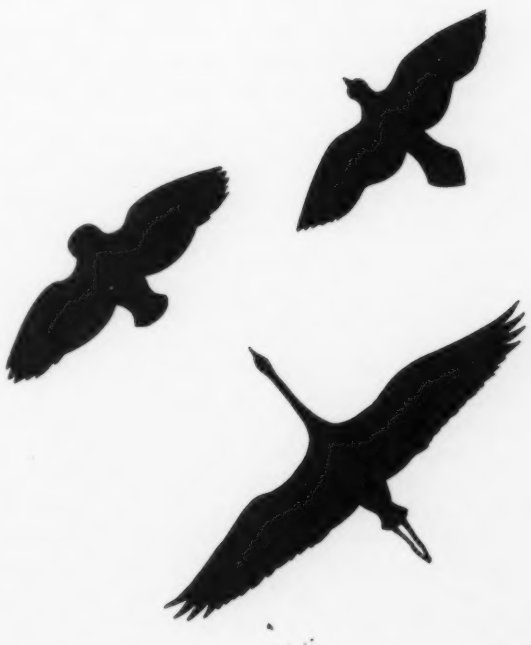
3. Central Flyway – Along the Missouri River and Gulf Coast of Texas.

4. Pacific Flyway – In the general area of Lake Tahoe and the Sacramento Valley area California.

Whistling swans are the largest common migrator waterfowl, and during the migration, concentrate in a narrow and fairly well-defined path passing close to the airports of Duluth, Milwaukee, Detroit, Toledo, Cleveland, Buffalo, Pittsburgh, Harrisburg, Baltimore and Washington, D.C.

Geese are considered the greatest hazard to aircraft because of their abundance, large size, occurrence in large flocks, relatively slow flight and high altitude of flight. Of the 400,000 to 500,000 Canada geese that migrate between Hudson and James Bays and the Mississippi Valley, over 100,000 pass through Horicon Marsh in Wisconsin. In migrating between Horicon Marsh and southern Illinois, the bulk of these geese pass about 25 miles west of Milwaukee's municipal airport and 50 miles west of O'Hare Airport, Chicago.

Canada geese migrate over several broad fronts. Atlantic Coast birds migrate up Chesapeake Bay, cross to Lake Erie and then fly north. Another flight goes up the Mississippi River and over the Great Lakes north to their breeding grounds. Birds wintering on the Great Salt Lake disperse to breed in the northwestern states and the



southern parts of the western Canadian provinces. West Coast geese migrate north along the coast to their breeding grounds in Alaska. The fall flights are over the same routes.

Snow geese and blue geese in numbers totaling 400,000 to 500,000 move down the Mississippi Valley on such a broad front in fall that they are likely to pass over or near most of the airports in the Valley. They concentrate at several places along the Illinois, Mississippi and Missouri Rivers, but seldom in numbers over 25,000. When they leave their Gulf Coast wintering grounds in March, the bulk of the population moves in masses gradually moving up the Missouri River Valley and southwest Iowa. The movement of several hundred thousand birds to the Missouri River Valley north of St. Joseph, Missouri, and their gradual movement up this valley creates conditions hazardous to aircraft in the vicinity of airports at Kansas City, Omaha, Sioux City and Sioux Falls.

Lesser snow geese fly at an estimated altitude of 3000 feet and migrate over a broad front through the Mississippi River Valley with the center of the spring flight passing over Louisiana, Arkansas, Missouri, Iowa, Minnesota, South Dakota and North Dakota. The full flight spreads further east, reaching into Michigan, Ohio and Indiana. Birds that winter in the Central Valley of California migrate through Tule Lake in northern California, Malheur Lake in Oregon and along the coast of British Columbia.

Mallard and Pintail are the most common North American ducks, but more specifically they concentrate in very large numbers in the Mississippi Valley and in the Central Valley of California. Each migration season about 7,000,000 to 15,000,000 ducks pass through the Mississippi Valley; 3,000,000 to 6,000,000 in the Central Valley of California, and 2,000,000 to 3,000,000 migrate through the Atlantic Coastal States.

The double-crested cormorant is a large, dark water bird similar in size and shape to a goose, but with very different habits. Cormorants usually migrate in flocks of 20 to 200 following the coastline closely and generally staying below 1000 feet. They are of concern primarily to airports in the immediate vicinity of the Atlantic Coast. An exception to the coastal route which the cormorant normally takes is the overland route in the fall from Boston Bay, southward across Massachusetts to coastal Rhode Island. Cormorants have been known to fly as high as 3000 feet.

The FAA ATC facilities do issue advisory information on bird activities when they are reported or when they have knowledge of such activities. So if you do spot a large flock of birds during the migratory season, report their position, their general heading and altitude so that this information may be passed on to the next pilot.

Generally speaking, the greatest hazard occurs during the landing and takeoff phase of flight. Birds will, however, try to avoid an aircraft if they are able to do so. Reducing speed at low altitudes and showing landing lights at night will help them and you to avoid each other. One thing to remember is that migratory birds tend to dive when closely approached by an aircraft. If you fly directly under migrating flocks of swans, geese or ducks, you may be helping to create a hazard. ◄

notes from your flight surgeon

As Required

WHEN the holdback ring broke just before catapult launch of a T-2B, the port wheel strut of the moving aircraft struck a catapult crewman in the head as he was moving clear. He was knocked unconscious. The ship's flight surgeon rendered first-aid on the spot. After 24 hours in sick bay, the crewman was released to full duty. The investigating flight surgeon reports that the crewman probably owes his life to the fact that he was wearing his flight deck helmet as required.

The Little Things

SINCE I have been in the Navy I have learned that being an aviator and flying from an aircraft carrier is a demanding profession. Professionals do not really vary a great deal. Professionalism almost always means that to do a good job one must pay attention to the little things – the things others usually forget about or neglect. These little things are, however, the things that keep pilots alive when they get into very tight corners.

Flight Surgeon in MOR

Signal Mirror

THE FLASHES of a signal mirror observed four to five miles away alerted the crew of a UH-1E to the position of survivors of a helo crash in the California hills. As the *Huey* approached, the men on the ground fired pen gun flares and threw fistfuls of dust into the air to indicate wind direction. The helo landed and completed the rescue.

The old-fashioned, non-avionic signal devices are still worth carrying!

Endorsement

"I CAN'T say enough for the LPA-1 life preserver," a pilot reports after ejection and helo rescue. "With seat pan and all, I weighed in the area of 250 pounds and the LPA held me very high out of the water. The collar firmly supported my head. There is no question in my mind that had I lost consciousness after deploying the LPA, I could have survived the mishap none the worse for wear."

Conductive Safety Shoes

A DPSC (Defense Personnel Support Center) review of requisitions for conductive safety shoes (FSN 8430-924-9319 series) over a six-month period reveals that 20 percent of all Navy requisitions were from ships. FMSO (Fleet Material Supply Office) Instruction 5101.1A states, "Conductive shoes are required to be worn by personnel in areas having conductive floors where a static discharge might ignite or detonate sensitive explosive materials, gas mixtures or flammable vapors. *Such footwear is not authorized for use in ships or in areas where electric shock hazards exist.*" Only the ordnance/ammunition activities listed in FMSOINST 5101.1A are authorized to use conductive safety shoes. Improper use of this item may result in severe personal harm.

Rescue Ball

A SELF-INFLATING throwable rescue ball, slightly smaller than a softball, which inflates in the water to a 21-inch lifering capable of supporting a 300-pound person, is now available in the Navy supply system. The assigned stock number is FSN 9C-4220-152-0841.

The rescue ball is authorized as additional equipment in excess of approved allowances of unicellular ring buoys. (Only inherently buoyant materials are permitted for primary lifesaving devices for general Navy use.)

Tests indicate that the device can be thrown with reasonable accuracy at distances of 50 to 75 feet and greater. Commander, Naval Ship Systems Command has advised that the following are considered appropriate locations for the self-inflating rescue devices:

- On surface ships, in three accessible locations: one forward, one amidships and one aft.
- Aboard boats, manned helicopters and other craft which are eligible for rescue at sea.
- On the bridges of submarines.
- On riverine craft, topside.

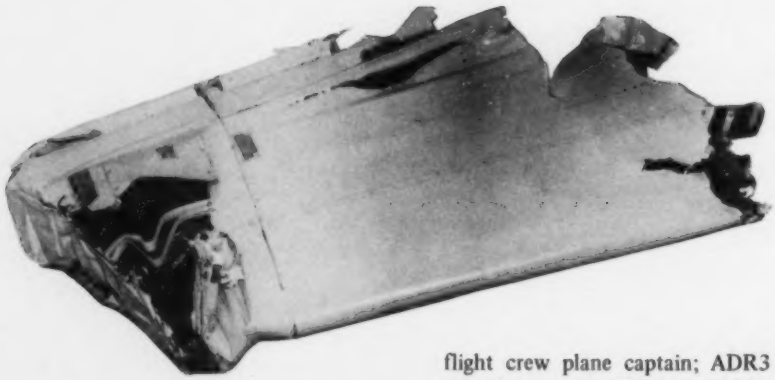
The rescue ball consists of a polystyrene shell containing a heavy duty yellow vinyl lifering. The whole device weighs 9½ ounces. When the ball contacts the water, an inflating device activated by water entering the shell inflates the lifering automatically.

Autobiographical Comment

"AS FOR the post-ejection water rescue portion, the single most glaring pilot error was a failure to give proper priority to shroud cutting and earlier employment of a knife to get rid of the chute. It may be positively stated that had the helo crew not reacted in the rapid, professional manner in which they did, survival of the pilot (myself!) would have become marginal due to increasing exhaustion and rapidly settling parachute."

The starboard wing with approximately 4-6′ of tip missing. Center portion of aileron is shown as it was bent downward 90 degrees, thus preventing any movement or control.

STRONG HANDS FOR A LIMPING LADY



The section of starboard wingtip of C-131F torn off by RF-4B in mid-air near MCAS El Toro.

DURING the evening of 24 November 1970, VR-30 C-131F aircraft, BuNo 141010, was proceeding southeast on airways at an altitude of 5000 feet MSL, in the vicinity of Dana Point Intersection (about 22 miles north of Oceanside, California). The aircraft was commanded by LT D. A. Simmons with LTJG J. R. Challancin as copilot and ADRAN R. D. Ratliff, flight crew plane captain; ADR3 T. C. Ekholm, flight attendant; and HM1 R. L. Marsh, flight attendant trainee. The aircraft had recently taken off from the Hollywood/Burbank airport on an IFR flight plan to NAS North Island with 32 passengers (all naval aviators) aboard. At about 1732 local (45 minutes after sunset), the C-131F was struck by an RF-4B which had just taken off from MCAS El Toro. The RF-4B was later landed safely.

As for the C-131F, the collision ripped off about six feet of the starboard wing. Another foot or so of the remaining portion of the wing was bent downward to a

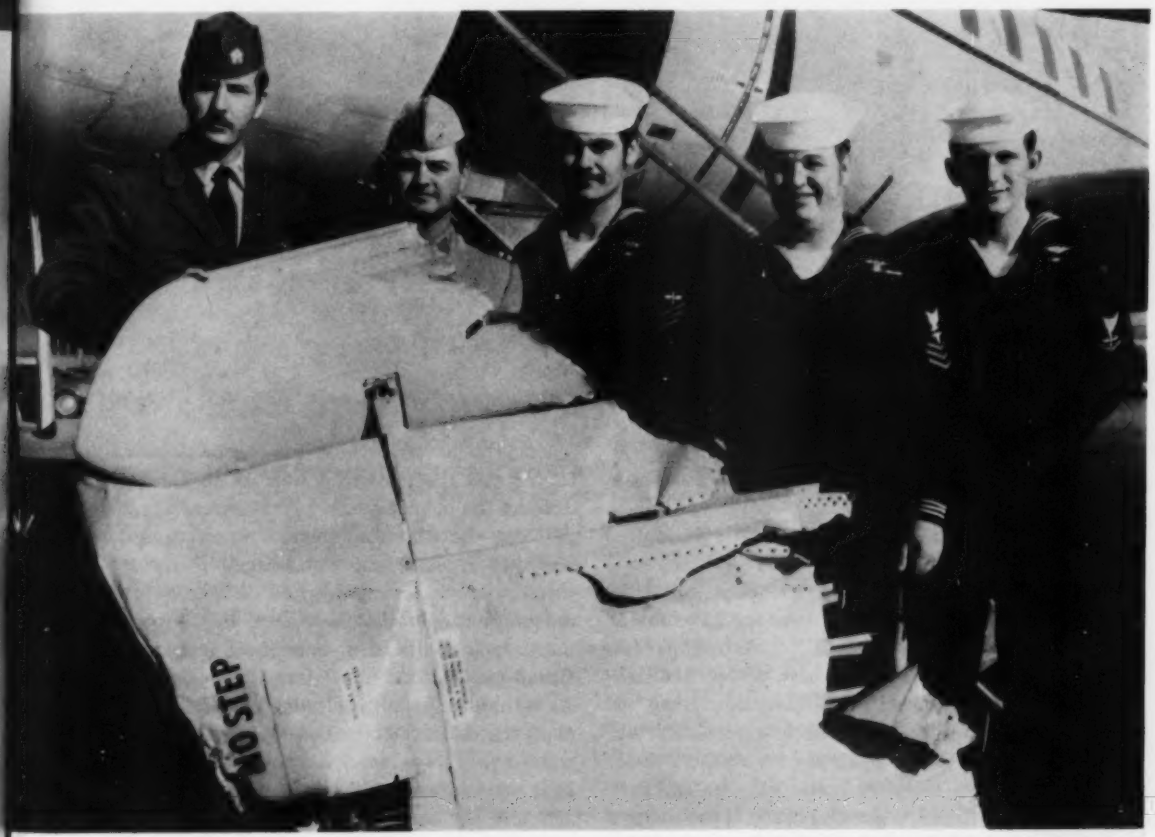
near vertical position. The aileron was jammed and all aileron control was completely lost. After impact, the aircraft yawed and rolled to the right. To regain control of the aircraft, maximum dry power was applied to the starboard engine and the port engine was idled. The copilot transmitted an emergency report of the mid-air and received vectors from El Toro RATCC to MCAS El Toro, runway 34, a distance of about 12 miles.

Using rudder and differential power, a turn to intercept the inbound course was accomplished. During this entire sequence, the aircraft was descending at rates varying from 300 to 1500 feet per minute. ADI (water injection) was selected and full throttle applied to the starboard engine in order to control the descent. Attempts to arrest the descent by applying power to the port engine complicated the controllability of the aircraft; therefore, the port engine was returned to idle power.

The lights of the field were sighted at six miles. The landing gear was successfully lowered approaching the runway threshold; however, an attempt to accomplish the landing by reducing power on the starboard engine resulted in a rapid yaw to the right. Maximum power was reapplied to the starboard engine and the landing was accomplished by flying the aircraft onto the runway with the port engine at idle and maximum power on the starboard engine. The pilot kept the aircraft on the runway and stopped it near the centerline. No damage was sustained during the landing. All passengers and crewmembers exited the aircraft uninjured.

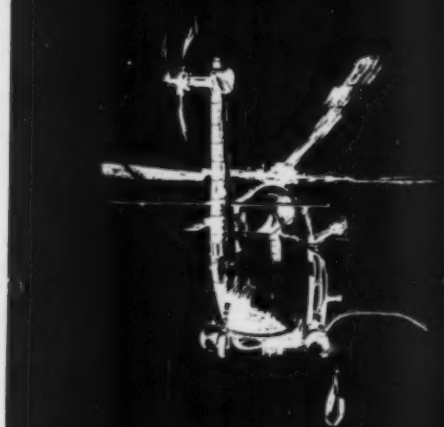
The crew of this aircraft responded to an emergency situation in a most outstanding, professional manner, averting a potential catastrophe which could have claimed 37 lives. The plane commander, LT Simmons, is deserving of particular praise. A recent COMNAVAIRPAC message noted that LT Simmons demonstrated the utmost professional expertise, calm judgment and superior aeronautical skill and adaptability.

Great save!



Crew of C-131F, BuNo 141010, involved in mid-air collision near MCAS El Toro on 24 Nov 1970. Left to right: LTJG James R. Challancin, USNR, copilot; LT D. Austin Simmons, USNR, pilot and aircraft commander; ADRAN Robert D. Ratliff, USN, flight crew plane captain; HM1 Ronald L. Marsh, USN, flight attendant; ADR3 Paul C. Ekholm, USN, flight attendant.

FAMILY AFFAIR



FOR more than 20 years small helicopter detachments have been operating from the decks of several non-aviation naval vessels. Each Det normally consists of two to six pilots and six to 22 enlisted personnel and may be assigned one to three aircraft. All of the officers and men who have served and are currently serving in these Dets have one thing in common – they're a proud group and rightfully so. Their derring-do in plucking downed aviators, crewmen and other personnel from the unforgiving sea and in a good many cases from the grasping hands of the enemy, has oft been cited. As an example, LT (then LTJG) Clyde E. Lassen, while attached to HC-7, Det 104, embarked in USS PREBLE (DLG-15) made a daring night helicopter rescue of two downed aviators in North Vietnam and was subsequently awarded the Medal of Honor. (See Rugged Rescue in the April 69 issue of APPROACH.) In addition to SAR, these small helo Dets may be assigned to vertrep, minesweeping and a host of other tasks befitting the helicopter's capability.

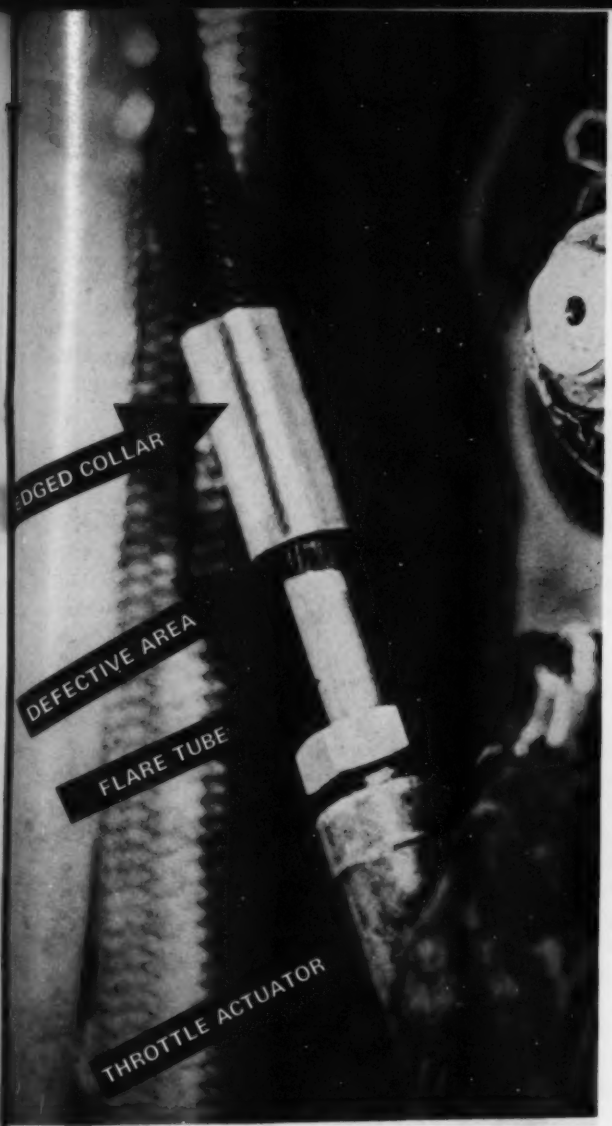
Unfortunately, the family affair atmosphere which prevails in small detachments sometimes leads to problems. Each officer and man is charged with a number of additional responsibilities he would not normally have in a larger Det or squadron. The great majority of these personnel accept the additional responsibilities in true Navy fashion by discharging them effectively and safely. In a few instances however, this is not the case and the aircraft mishap described below is one such example:

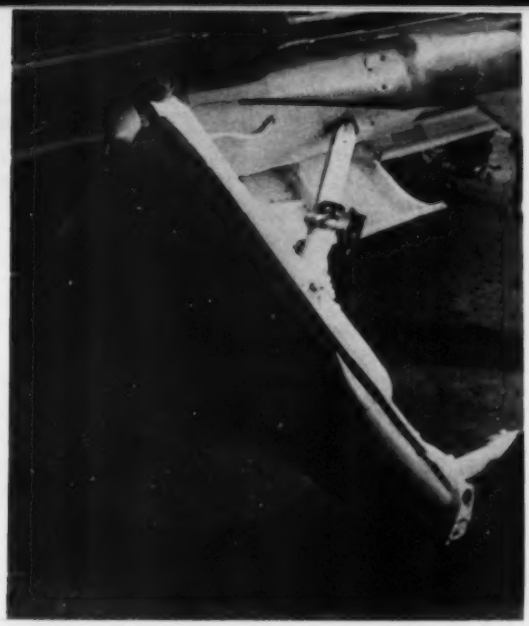
It was a pretty nice day at Foreign International Airport when LT Happy Daise and his copilot, LTJG Orville Rhong, prepared for takeoff in their UH-2 for USS CRUISER tied up at pierside in the large port city located some 40 miles from the airport. The ceiling was 9000 feet, visibility 7 nm, wind from 120 degrees at 4 knots, temperature 85^{0}F and the density altitude 2290 feet.

After a successful preflight and engine start three passengers (one a high ranking naval officer) boarded the helo and the crewman then took his proper position. The rotors were engaged and following the takeoff checklist the pilot lifted the *Seasprite* off the deck and headed for the cruiser.

Thirty minutes after takeoff LT Daise contacted USS CRUISER via UHF and gave his position and ETA. The ship then reported the wind to the helo as being 120 degrees at 3 knots. LTJG Rhong commenced the landing checklist and reported over the ICS that the checklist was complete except for gear. The crewman then reported that he and the passengers were ready for landing. As the aircraft slowed to 80 knots the pilot directed the copilot to lower the landing gear, which he did. The pilots checked the gear visually and the UH-2 was in all respects ready for landing.

As the aircraft approached the cruiser the pilot noticed multiple obstacles around the landing area and particularly the pennant line strung from masthead to fantail (an obstacle 25-30 feet high in the flight path). As a result LT Daise elected to execute a precision approach to the helo pad on the pier where the cruiser was berthed. The approach was commenced into the light wind which was blowing down the pier towards the ship and helo pad. Altitude at this time was 150 feet and airspeed 25-30 knots. The pilot noted that there were many people on the pier and that a truck was parked just up the pier from the landing pad. At 60 feet of





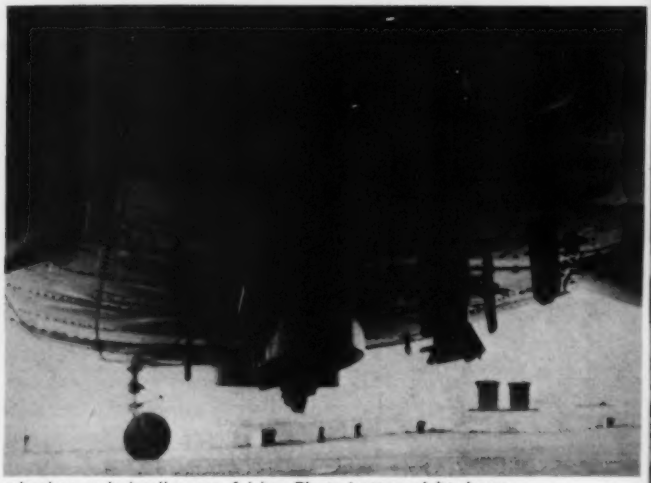


Photo on left shows the broken teleflex conduit. Upper right photo shows a broken main landing gear fairing. Photo bottom right shows damage to the underside fuselage.

altitude the pilot began increasing collective to slow his rate of descent. Both pilots noted that rotor RPM had dropped to 96 percent. LT Daise held the collective steady and checked to make sure the range control was in the fly position. Rotor RPM stabilized at 96 percent and the approach was continued. With the helo at 30 feet over the helo pad the pilot added power for a transition to a landing and encountered an abrupt power loss with rotor RPM further decreasing to 88 percent. The pilot lowered the collective slightly and eased the nose forward transitioning from a precision type approach to a run-on, low power, maximum gross weight type landing. At this point in the approach LTJG Rhong, assuming a waveoff had been initiated, raised the gear *without telling the pilot*. At 10 feet of altitude LT Daise flared the aircraft, touching the tail wheel first to cushion the landing on the main gear. The aircraft touched down on the cargo hook as rotor RPM drooped to 82 percent but began building back up after touchdown. Since LT Daise was able to maintain control of the UH-2 after touchdown and also smell gas fumes which indicated a possible fuel cell rupture, he ordered the passengers and crewman to disembark. After they were clear of the aircraft, he lifted the bird into a hover and lowered the gear. The gear pins were installed and the aircraft was landed and shut down without further incident.

On the surface it would appear that the copilot was

the only culprit involved in the mishap described above. However this isn't quite the case. There were many cause factors leading to this mishap and the family affair atmosphere is certainly suspect. To better illustrate this point let's go back and reconstruct preceding events.

Over two months prior to the mishap the helo had an unusual yellow sheet gripe written by the pilot, LT Daise. He stated that turbine speed increased 6 percent before decreasing on engine shutdown. An attempt was made by the pilot to duplicate this same condition while maintenance personnel looked on but it was unsuccessful and no further action was taken. From that time until the accident occurred several yellow sheet gripes were recorded concerning unexplained increases and decreases in turbine power. In each case corrective action consisted of adjusting the beep range.

Five days prior to the mishap LT Daise made a yellow sheet entry that the range control slips out of FLY with power addition. Maintenance rerigged the throttle assembly and droop compensator. Three days later another yellow sheet gripe was made by the pilot that the engine beep range was low. The throttle, fuel control and droop compensator were rerigged by maintenance. At this time the maintenance crew noticed that the teleflex conduit was broken between the swedge collar and the flare tube at the throttle actuator end. They stated to the AAB that, although they did not check the MIM (Maintenance Instruction Manual), they did not think this was grounds to down the aircraft. As a result, a test flight was flown and the aircraft was placed in an UP status. Had the defective teleflex conduit been replaced, the probability of this accident happening would have been practically nil.

Inadequate performance by maintenance personnel as described above can be directly attributed to *inadequate supervision.* The second pilot of the detachment is designated as maintenance officer by squadron instruction. In this case LTJG Rhong was unfamiliar with his duties and in fact did not function as the maintenance officer. He allowed the maintenance gang carte blanche in performing their tasks. No wonder the mechanic who discovered the broken conduit failed to replace it, refer to the MIM or notify the crew leader, LTJG Rhong or LT Daise. Inadequate supervision is facilitated in small detachments of this type, as one petty officer is frequently charged with quality assurance supervision for all maintenance performed on the aircraft. While a small integrated maintenance crew often has considerable pride in its unit, undue confidence is sometimes placed in individual crewmembers. LTJG Rhong's failure to properly supervise his men led to their becoming lax and complacent. This is bad enough in a large unit but in a small detachment it is critical.

In addition to the discrepancies noted above the AAB discovered that the detachment had not used the daily and preflight Maintenance Requirement Cards during the month preceding the accident nor had the Preflight/Daily/Inflight maintenance records been kept. One of LTJG Rhong's duties was to review these documents daily.

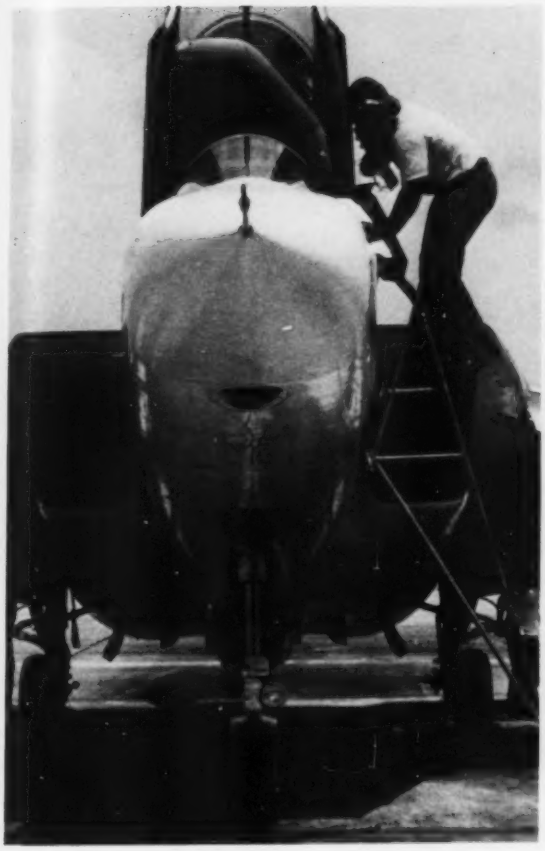
Maintenance personnel were listed as the primary cause factor of this mishap. LTJG Rhong contributed to the accident by raising the gear without being told to do so and for inadequate supervision as the maintenance officer. There's one other contributing cause factor to this mishap which wasn't included in the AAR but was brought to light in each of the endorsements thereto. How about LT Daise! Should he be absolved of all responsibility? Not on your life. As the Helicopter Aircraft Commander it was his responsibility to ensure that all facets of the flight were thoroughly briefed and this included such things as lowering and raising the landing gear. It was brought out in the AAR that it was customary for LTJG Rhong to raise and lower the gear without being told while the detachment was operating at sea. It is gratifying to see a HAC who has such confidence in his copilot, however, he should have taken steps to ensure adequate communication was maintained in the cockpit. This is especially true when the aircraft is operating in an unfamiliar environment as was the case preceding this mishap. The HAC must rebrief the crew so that there will be no misunderstanding as to what the proper procedures will be at that time. Obviously this wasn't done because the pilot had no idea his copilot had raised the gear prior to his setting the aircraft onto the helo pad.

Being officer-in-charge of a small detachment is a most rewarding experience. It's a good opportunity for a junior naval aviator to demonstrate his command potential. The record to date clearly indicates that the great majority of these young OICs have done splendid jobs. By showing what can happen when the family affair is allowed to progress beyond reasonable limits it is hoped that mishaps such as the one described herein will be eliminated.

Your credit is always good when you try to borrow trouble.

Ace L.

QUITE AN ARM TWIST!



A PORTION of present day RP (Replacement Pilot) training is practice sessions of engaging an aircraft's IFR (Inflight Refueling) probe with the basket (drogue) trailing an airborne tanker aircraft. In the case portrayed by these two photographs, the results of such an airborne encounter were somewhat other than had been planned for.

With the services of an A-6A tanker aircraft available, three RA-5C RPs were checking out on proper inflight refueling procedures. Nothing unusual had occurred until the case illustrated came up. As one aircraft was being maneuvered into position, the probe tapped the basket at the 3 o'clock position, tipped it outboard and over the top of the probe with the hose on the left. In an attempt to disengage, the pilot inadvertently allowed the RA-5C's nose to descend slightly in a left bank sufficiently to lodge the hose and basket about the probe, placing an excessive strain on the probe with the result that it became twisted and bent, as shown in the first photograph. As a reaction to the developing situation the pilot immediately went into a climbing attitude, during which the probe and basket disengaged.

As can be seen in the second photograph, the refueling hose was flipped over the port stabilizer of the A-6A tanker. Despite repeated attempts by the pilot to remove the hose from this position, none were successful. The A-6A landed with the hose and basket trailing and suffered no damage, though the basket did not fare as well. The RA-5C was also recovered without additional damage.

Line Walkdown — FOD prevention is an important part of any safety program.

Are You Hooked?

Grounding an aircraft is an important safety function.

VT-27 is hooked on GSP! What we're actually addicted to is our Ground Safety Program which may be defined as a combination of prearranged courses of action to provide personnel with the means to avoid danger or injury.

The purpose of such a program is, of course, to protect as many lives as possible from hazards. While it is true that safety hazards can be found most anywhere, even in one's home, the problem of safety within a squadron's hangar area is exceedingly complex due to the very nature of the work performed there and the types of materials used to accomplish this work. For instance, some of the safety hazards which might readily be found in squadron areas include prop arcs, jet intakes and exhausts, smoking near aircraft, allowing aircraft to remain ungrounded, improper use of support equipment (yellow gear), presence of FOD in the line area and improper use of fire extinguishers, all of which can cause unsafe conditions. Failure to use available safety equipment such as steel-toed shoes, goggles or protective gloves is still too common and personnel should be

per use of side rails and safety pins on intenance stands will prevent many idents.

Always use the mechanical safety features on hydraulic jacks, they may save a life or a costly accident.

Always, *always* use safety goggles when needed.

Safety lines around an aircraft would avoid "shortcutting" by unauthorized personnel.

taught to take advantage of such safety items furnished for their protection.

Because safety hazards cannot be eliminated once and for all, due to their recurring nature, this squadron has taken the initiative and has established a SPOD (Safety Petty Officer of the Day) watch for the purpose of maintaining and expanding the benefits of an already sound Ground Safety Program.

Even though the GSP is the responsibility of every individual within the command, the SPOD plays an especially important role – he is the squadron's "Life Assurance" – as he offers free services and unequaled benefits.

His primary responsibility involves a daily inspection of the entire ground area encompassing the squadron. While on the inspection tour he will correct any hazards readily adjustable, with verbal instructions or reminders to negligent individuals. All hazards noted on his inspection tour are entered in a log. Log entries which consistently recur are discussed at a monthly meeting of the Ground Safety Council, attended by representatives from all divisions. In this meeting any problems, possible solutions and recommendations are discussed. Information gathered at these meetings is assembled in a report and submitted to the commanding officer, who in turn disseminates it to the various divisions.

The benefits from an effective and dynamic Ground Safety Program cannot be overestimated. At Training Squadron TWENTY-SEVEN, we consider the program one of our greatest success stories. Obviously, continued alertness to safety in conditions, materials and work habits leads to continued health and security. The SPOD acts as our conscience and a daily reminder of the small or large items we ourselves forget or neglect in the haste to accomplish our mission.

While "Life Insurance" will cover one if he dies, the "Life Assurance" provided by the SPOD will delay the day our beneficiaries collect on the former.

This is another excellent program designed to conserve the Navy's resources – its men and machines. – Ed.

Don't Be Rushed Into An Accident

AN S-2E was recovered aboard ship, spun out behind the island and shut down. Night refresher landings were in progress as the aircraft was being refueled and preflighted for a quick turnaround to join the carrier qualification pattern. The pilots quickly preflighted and manned the aircraft and, as the pilots took their seats, the copilot saw a plane captain on top of the wing but strapped in without checking the top of the aircraft. The plane captain completed his preflight duties while the aircraft was being started and climbed down off the wing.

After the aircraft was started it was quickly launched. It made two passes to waveoffs and then a trap. The flight deck troubleshooters downed the aircraft on deck for excessive oil on the port cowling/nacelle. Inspection revealed that the access plate was dzused down but the oil cap was off (it was found lying next to the filler neck).

This incident was caused by the failure of the plane captain to secure the oil cap and by the pilots' failure to check that it was done. The squadron commanding officer commented:

"A number of people were caught up in the rush to get the plane airborne and made serious errors in judgment. The plane captain thought he put the port oil cap on, but his flashlight failed as he was putting it on and he was not positive that it was done correctly. He didn't take the time to get another light to check.

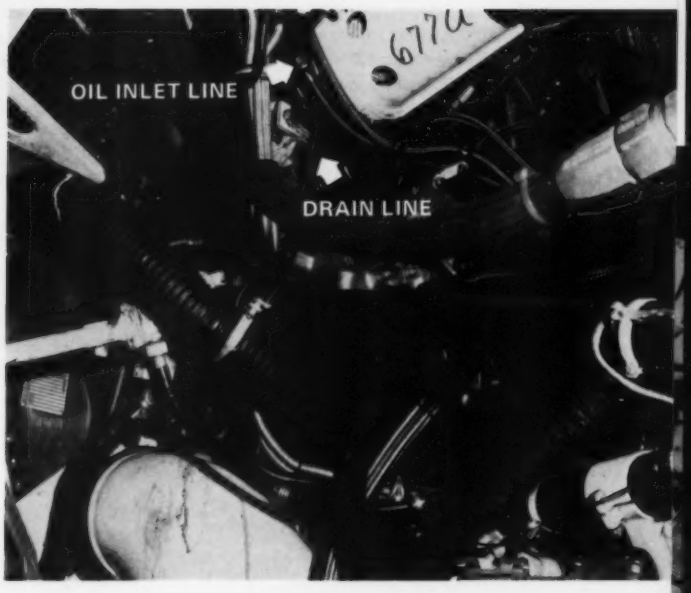
"As the plane captain was crossing from the port wing to check the starboard oil cap cover, the pilot was also rushing. He started the port engine without giving any thought to the plane captain who might still be up there. The yellow shirt didn't see the plane captain, partly because of the dark night and partly because he was standing close to the aircraft. As the plane captain filled the starboard oil tank, the pilot started the engine, blowing oil across the wing and making footing hazardous. The plane captain quickly secured the oil cap (properly this time) and exited the aircraft. The copilot had forgotten about the plane captain but assumed he'd properly secured both oil caps.

"The press of operations is no excuse for shortcutting proper procedures. The primary responsibility for checking that the oil caps are secured rests with the pilot. He must also ensure that plane captains/troubleshooters are off the top of the wings when starting engines. This close call should emphasize that all evolutions (especially during carrier qualifications) can go only as rapidly *as safety permits.* Each individual has a responsibility not to let himself be rushed into an accident."

As narrated, several individuals were involved in the development of this incident. Any one of them could have stopped its progress by exercising due care. The pilot should have taken the time to preflight the aircraft. The copilot could (and should) have held up the start until he was sure the plane captain was clear. The plane captain could (and should) have halted the start until he could obtain another flashlight and insure that the cap was secured. Finally, the yellow shirt should have made a positive check to insure everyone was clear before giving the start signal.

This incident was fully preventable. ◄

MURPHY'S LAW *



How To Pump The Oil Well Dry

ONE should expect that each new model of an aircraft would be more Murphy free than the previous model but it seems that there is always "one more" condition that was not resolved and Murphy strikes again.

After completion of a 91-day inspection, an S-2E aircraft was wheeled out to the line and positioned for a turnup and checkout. Very shortly after starting the port engine, the plane captain/director noticed fluid coming out of the bottom accessory cowling and immediately signaled for the engine to be secured.

Investigation into the cause of fluid leakage revealed that the oil inlet line to the engine mounted gearbox of the CSD was incorrectly connected to the drain fitting of the gearbox. The drain line was connected to the oil inlet fitting. Both lines are the same size and have identical end-fittings. Since these lines are mounted very close to each other, it is very easy to cross-match them to the fittings of the gearbox.

As an interim measure, the squadron on whose aircraft this Murphy occurred is color-coding the oil inlet line and has recommended a change in the size of the drain fitting as a permanent fix.

* If an aircraft part can be installed incorrectly, someone will install it that way.

LETTERS

The harder I work, the luckier I get.
Lee Trevino

Parachuting Techniques

Seymour Johnson AFB, N.C. – I read your article on parachuting techniques by LCDR Paul Furr, MSC, USN and if you will allow a couple of comments from a USAF type, I'd like to add a few points to an excellent article.

The Air Force has been advocating and teaching a technique called the "four line cut" that improves the handling characteristics of the standard issue parachute. Basically it involves cutting two shroudlines from each of the rear riser groups thus creating a "hump" or a bulge in the rear of the canopy. This allows the chute to become much more maneuverable while at the same time slowing the rate of descent due to the horizontal component imparted to canopy motion. Local modifications include marking the lines to be cut with bright red tape or incorporating a release mechanism to the affected lines and connecting lanyards to these releases and running them down the risers where they can be easily reached by the chutist after chute deployment.

The four line cut is made only after the canopy has been fully inflated and checked for tears, figure eights, etc, and is accomplished using the hook blade shroudline cutter or the above-mentioned shroudline release lanyards.

I would take exception, and several other jump-qualified types in the squadron agree, that facing into the direction of the horizontal travel when making a PLF (parachute landing fall) is asking for trouble. Most jump instructors I know recommend facing away from the direction of travel so as to preclude tensing up as you anticipate hitting the ground and also getting beat up by any brush, ground obstruction, etc, after you land.

I enjoy reading APPROACH whenever I can get at one here in the squadron and hope to see more articles of this nature in future issues.

MAJ George F. Skelly, USAF

• The article on parachuting techniques represents the author's personal views from his experience as a test parachutist. Navy pilots do not receive formal indoctrination in parachuting techniques. Student parachute riggers who volunteer for jump training are taught not to control their landings and not to look at the ground – keep feet together, knees slightly bent, hands on risers and eyes on the horizon. They are instructed to go with the direction of the fall once contact is made with the ground. (Please see LCDR Furr's comments on the eyes-on-horizon question in answer to the next letter.)

Thank you for your kind words about APPROACH. We have a second article on parachuting coming up in a few months – this one by Senior Chief Aircrew Survival Equipmentman H. W. Picard, a Navy parachutist with more than 1300 military jumps to his credit.

FPO, New York – The article "Parachuting Techniques for Naval Aviators" by LCDR Paul Furr, MSC, USN, in the December APPROACH was extremely well written and informative. I am sure it will instill faith in the Navy's personnel parachutes.

I am a sport parachutist with several hundred jumps to my credit and hold a current Class C advanced license and a jumpmaster's rating certificate. I have been training student parachutists for more than two years and have never had an injured student or any injury of any consequence to myself. Therefore, I feel justified in making a comment on one statement in the article and in taking exception to another.

The paragraph on page 28 subtitled "*Legs together and slightly bent*" is good and true as far as it goes. I think, however, it should be "legs and feet together and slightly bent with the toes slightly pointed."

Two paragraphs later I am in total disagreement with the author: "An often discussed topic in parachuting is the ability to predict time of impact with the ground by watching the horizon. If the aforementioned rules are followed, observing the horizon or the ground underneath makes little difference to the landing fall."

When you watch the ground you will unconsciously try to anticipate ground impact and, therefore, tense up and probably get hurt as a result. If you look off to the horizon and are prepared to land in every other respect you will get impact as a known "surprise" and almost automatically make a good landing fall. This is the way almost all sport parachuting students are taught to land.

AMS2 Jan F. Tlush, USN
Keflavik, Iceland

• We forwarded your comments to LCDR Furr. He, in turn, states:

"I thank AMS2 Tlush for his well written letter and appropriate comments. His point about legs 'and feet' together and slightly bent 'with the toes slightly pointed' is well taken. I think he is correct in what he teaches and I implied this point when I said 'legs together, etc.' though perhaps not too strongly. (Come to think of it, it would be somewhat awkward to hold the legs together and the feet apart.)

"On the second point, that of eyes on the horizon during a landing, AMS2 Tlush and I are not really in disagreement. My point is the *emphasis* that should be placed on this technique. This was discussed with several naval test parachutists when the article was being prepared and was a subject of discussion on numerous occasions when I was

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request.

Address: APPROACH Editor, Naval Safety Center, NAS Norfolk, Va. 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

active as a test parachutist at the Naval Aerospace Recovery Facility, El Centro, Calif. I found varying opinions but all agreed that when the basic guidelines were followed as expressed in the APPROACH article, watching the horizon or the ground was somewhat academic. The point, I think, which Mr. Tlush really wants to make and, in fact, alludes to, is to avoid 'reaching for the ground' as one might be inclined to do by watching the ground immediately underneath. On this point there seems to be universal agreement. So why not emphasize that important point? Anticipating the time of impact, unconsciously or otherwise, is almost universal and unavoidable with the novice. Thus, I think it is a misplacement of emphasis to try to teach a novice to avoid this anticipation. The point here is to avoid injury caused by not having the legs (and feet) together, slightly bent, etc.

"The philosophy I expressed in the APPROACH article is one of providing a few effective guidelines for people who may never jump out of an airplane, vice specific training for those about to make premeditated jumps. I tried to keep the article simple so that readers would remember general guidelines. Indeed, at physiology training unit lectures which aircrewmen are required to attend every three years, only 10 to 15 minutes can be devoted to this subject in a busy schedule."

Shroudline Entanglement

FPO, San Francisco – I read with great interest the article "Parachuting Techniques" by LCDR Paul Furr in the December 1970 APPROACH. It was well-written and informative. If I may, however, I beg to differ with him on a few small but important points concerning "feet wet" landings. I feel somewhat qualified to make these points, being Officer-in-Charge of the Navy's Paramedic Rescue Team Number ONE at NAS Cubi Point. We have developed and taught overwater SAR crewman techniques now used in SEA.

When making a water entry, we feel that the biggest problem has been and continues to be shroudline entanglement. Most aviators have no problem remembering to drop and inflate their rafts and to inflate their life preservers but this being done, they often fail to release the koch fittings upon water entry. The parachute which just saved an aviator's life now becomes a deadly sea monster as it fills with water and pulls him down. Shroudlines encircle his neck, arms and legs and the problem is often compounded by the use of the shroud cutter as the number of entangled lines multiplies when they are cut. *Prevention is much simpler than the cure.* Water entry should be made with both hands (ungloved as nomex becomes slippery when wet) on the koch fittings. When the feet enter the water, both fittings should be released simultaneously. The survivor should then swim away from the canopy if able. Of course, the same rules apply to non-ejection seat type canopies such as the back or chest chutes utilized in multiplace aircraft except the fittings will differ. In any event it is *imperative* that the canopy be ditched at the *instant* of water entry. Experience has shown that this is truly the best procedure and makes the recovery much easier for both the downed aviator and SAR crewman.

I couldn't agree more with LCDR Furr's last sentence: "Follow these rules and enjoy the ride down – it can be quite peaceful and serene – if you can relax long enough to notice it."

LCDR Myron M. Pershoff, MC, USNR
NAS Cubi Point

● You and the author of "Parachuting Techniques" are not really in disagreement on "feet wet" landings. He stated that entanglement continues to be a problem, then went on to discuss two possible ultimate solutions to the problem – an automatic canopy release device and the encapsulating liferaft. Thank you for reminding APPROACH readers of the techniques of canopy divestment which will minimize the hazards of shroudline entanglement now, with existing equipment.

San Diego, Calif. – The following narrative by ADJ3 James R. Hardman, USN, and the accompanying photograph illustrate the value of safety shoes.

"I was sent out to the line to perform a transfer inspection on an aircraft. During the inspection a plane captain was in the process of parking an NB-3 (electrical power unit) next to the aircraft and asked for my assistance to check clearance. He pulled the power unit alongside the aircraft and stopped it. I thought he was finished moving the power unit so I stepped forward to unhook the NB-3 from the tow tractor. At about the same instant he pulled the power unit forward another 12 inches or so. In the process, my right foot was pinned under the unit's right front wheel and dragged along the deck. Immediately he backed the power unit off. *The only damage was to my safety shoe with no injury to my foot whatsoever."*

LT Donald W. Streeter, Jr.
Aviation Safety Officer, RVAW-110
NAS North Island

● It's another safety shoe save, folks!

Division Of Public Documents
Government Printing Office
Washington, D. C. 20402

Please send APPROACH (NavAir 00-75-510) for one year to the following address. Enclosed is a check or Money Order for $6.00. ($7.50 for foreign mailing.)

Name .....

Address .....

City ..... State ..... Zip Code .....

Vol. 16 **approach** No. 10

RADM W. N. Leonard
Commander, Naval Safety Center

Our product is safety, our process is education and our profit is measured in the preservation of lives and equipment and increased mission readiness.

Contents

1 Safe Instrument Flight
10 Double Jeopardy
14 Uneasy Rider
19 Laminated Glass Windshield Panels
24 The Naval Safety Center Salutes VS-33
26 Maintenance Management
32 It's for the Birds
By John E. Berta
36 Strong Hands For A Limping Lady
38 Family Affair
41 Quite an Arm Twist!
42 Are You Hooked?
44 Don't Be Rushed Into An Accident
IBC Navy Private Motor Vehicle Deaths Down

Departments

48 8 Short Snorts
16 Anymouse
35 Notes From Your Flight Surgeon
45 Murphy's Law
46 Letters

NavAir 00-75-510

Purposes and policies: Approach, published monthly by the Naval Safety Center, presents the most accurate information currently available on the subject of aviation accident prevention. Contents should not be considered as regulations, orders or directives and may not be construed as incriminating under Art. 31, UCMJ.

Photos: Official Navy or as credited. Non-naval activities are requested to contact NAVSAFECEN prior to reprinting APPROACH material.

Correspondence: Contributions are welcome. The right to make editorial changes to improve the material without altering the intended meaning is reserved. Reference to commercial products does not imply Navy endorsement. Views of guest written articles are not necessarily those of NAVSAFECEN.

Distribution: Requests for distribution changes should be directed to NAVSAFECEN, NAS, Norfolk, Va. 23511. Phone: Area Code 703, 444-1321, Att: Safety Education Dept., IF YOU ARE A PAID SUBSCRIBER, address all renewals and address changes to Division of Public Documents, Washington, D. C. 20402.

Subscriptions: Single copy 60 cents; 1-year subscriptions $6.00; $1.50 additional annually for foreign mailing.

Printing: Issuance of this periodical approved in accordance with Department of the Navy Publications and Printing Regulations, NAVEXOS P-35. Library of Congress Catalog No. 57 60020.

CAPT H. Glenzer, Jr., Director of Aviation Safety Programs
CDR J. O. Yanaros, Head, Safety Education Department

CDR W. J. Isenhour, Editor
LCDR T. C. Kennedy, Managing Editor
Robert Trotter, Art Director
J. A. Bristow, Life Sciences Editor
W. E. Cumbie, Military Editor
C. B. Weisiger, Helicopter Editor
R. A. Eldridge, Special Ops Editor
R. T. Forbush, Technical Editor
R. L. Marcoux, Maintenance Editor
Blake Rader, Illustrator
William Langston, Illustrator
PHCS T. J. Collins, Photographer
K. E. Warmack, Editorial Assistant

Credits

Sweeping into view the Navy's stalwart A-6 *Intruder* presents a picture of reliability and strength of purpose. Cover painting by Craig Kavafes, courtesy Grumman Aircraft Engineering Corp., Bethpage L.I., Pg 3 Photo: Art Schoeni, courtesy LTV, Pg 19-22 Diagrams courtesy Lockheed California Co., Pg 32-33 Photo: Phillip Morrison, Pg 32-34 Art: Emily Whaley, IBC Photo: Norfolk Police Department, Norfolk, Va., OBC "Raven's Cry" by Saule Ruby from the XXIV Annual American Drawing Exhibition, photo courtesy Norfolk Museum of Arts and Sciences, Norfolk, Va.

Navy Private Motor Vehicle Deaths Down

PRELIMINARY data compiled at the Naval Safety Center indicate a reduction in the number of Navy personnel killed in traffic accidents during 1970.

During 1969, 432 Navy personnel lost their lives in private motor vehicle crashes while 352 died during 1970. This represents a 10.6 percent reduction in the private motor vehicle fatality rate (computed as the number of deaths per 100,000 man-days). Even though an overall reduction occurred, there was an increase in the rate for both pedestrian and motorcyclist deaths during 1970. The two-wheeled vehicles accounted for 46 sailors in 1969 and 54 in 1970. In the battle between vehicles and pedestrians, 27 pedestrians lost out in 1969 and the motorized vehicles claimed 32 walkers in 1970.

The overall reduction, however, was not caused by any one single factor or action. Some of the primary reasons for the reduction in the Navy as well as in the nation were:

- Increased emphasis on traffic safety in the various civilian and military news media. More articles, stories, advertisements and newscasts related to the carnage on the highway appeared than in previous years.

- Federal legislation had a definite impact with all of the changes in vehicle construction. Many states enacted legislation to make their drivers and roads safer.
- In the Navy the National Safety Council's defensive driving course was presented to more than 162,000 persons and deserves partial credit for the lives saved.
- Many individual Navy commands went beyond the required defensive driving course with aggressive traffic safety programs individually tailored to their needs.

Although the national figures of motor vehicle deaths are not yet complete, there appears to be a nationwide reduction.

The Naval Safety Center is looking closely at the two areas where deaths have increased – the pedestrian and the motorcyclist. Steps will be taken to protect both categories by making them more visible to the motorist. All cyclists are being made more aware of the hazards involved. Impetus has been added to Navy-wide traffic safety efforts by this reduction in deaths and private motor vehicle fatality rate. Lives can be saved, suffering can be alleviated and dollar losses can be reduced by the promotion of traffic safety, but *it is everybody's responsibility.*

STRIKE!

BIRD–AIRCRAFT COLLISIONS ARE MOST COMMON ALONG THE FLYWAYS OF BOTH COASTS, AND HAVE INVOLVED JETS, PROPS AND HELOS. MOST OF THE ACCIDENTS OCCUR DURING TAKEOFF AND LANDING AND SOME HAVE BEEN REPORTED AS OCCURRING BOTH DAY AND NIGHT. AS DAMAGE RANGES FROM DENTED LEADING EDGES OF WINGS AND TAIL SURFACES TO INGESTION INTO INTAKE DUCTS CAUSING ENGINE FAILURE AND FORCED LANDINGS, IT WOULD PAY YOU TO READ THE ARTICLE BEGINNING ON PAGE 32 AND FIND OUT EXACTLY WHY

IT'S FOR THE BIRDS